

# Information Disclosure Readability, Cognitive Style, and Investment Decision Making: A Web Experimental Study

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## ABSTRACT

The purpose of this research is to investigate the impact of disclosure readability and cognitive style on investment decision making. Using processing fluency theory and cognitive style model the researchers extend [1] by considering how individual cognitive style has interaction affect on disclosure readability and investment information searching and decision making. In human information processing, an individual cognitive style is considered before making a decision; however, it is rarely investigated by previous research. Using web-based experiment on 86 accounting and management master program as an investor; the researchers present those investors with two level firm's internet financial reporting readability (high/low), and measure investor cognitive using cognitive style index (analytic/intuitive). Consistent with our prediction, the researchers find that investor searching behavior is more sensitive to outside information when internet financial reporting less readable, meanwhile the interaction with cognitive style not supported. Furthermore, the researchers found evidence that individual cognitive style is moderating disclosure readability and investor decision. This study gives both academic and practice contribution. Academically, it broadens ones understanding of disclosure readability and cognitive style and provides opportunities for new avenues of research in decision making. In practice, it gives management early warning for being careful in choosing firm disclosure strategy.

**Keywords:** *disclosure, readability, cognitive style, investment decision*

## 1. INTRODUCTION

The successful communication of financial reporting information requires the adequate disclosure of understandable numerical data as well as the provision of readily comprehensible narrative information [2-4]. Complex narratives that are beyond the comprehension ability of the intended target audience may therefore lead to misinterpretations and reduce the decision quality of financial statement users [3].

This paper developed by [1] using individual psychological factors, cognitive style, as a moderating variable. In psychological studies, judgment and decision are closely related to individual psychology differences that affect human information processing [5, 6]. Each personality type determined how individuals acquire, process, and make decisions on available information [7]. In other words, individual psychology differences influence individual judgment and decision. There are several dimensions of individual psychology differences, for example, tolerance of ambiguity and decision style [8], cognitive style, and personality [5, 6]. In this study, the

psychological dimension of cognitive styles represents individual consistency in collecting and processing information [9] when the two level of disclosure readability (high/low) presented.

This study produces two results: the influence of disclosure readability on information searching behavior and investment decision are strengthened by the individual cognitive style as moderating variable.

This study contributes both academic and practice. Theoretically, give broaden understanding about disclosure readability through considering individual cognitive style. Practically, it would be guidance for parties firms and investor in developing firm disclosure and investment valuation strategy.

## 2. LITERATURE REVIEW

### 2.1. Processing Fluency Theory

Processing fluency theory is an information processing theory from a branch of psychology. At the beginning of its development, psychological research investigated quite a lot of processing fluency [10-14], however [15] presented framework processing fluency more comprehensively.

Processing fluency theory (PFT) is a theory explaining meta cognitive experience about the convenience of individuals in processing information for making a decision [15, 16]. Research [16] defined meta cognitive experience as cognitive feelings that accompany individual thinking processes, such as how easily an information can be remembered and processed. PFT predicts that the easier information is read (readable), the information will be more easily remembered, processed, and made the basis for making accurate judgments or decisions.

According to the view of behavioral judgment and decision making, processing fluency (information processing) has an important role in assessment and decision making. This view assumes that in making judgments and decisions, individuals are not only based on the planned process of thinking and rational calculation but also influenced by a set of experienced systems (experiential system) such as mood (mood), feeling (feeling), and meta cognitive experience. PFT is an information processing theory that reflects the ease of meta cognitive experience of individuals in processing information and making a judgment or decision. Fluency occurs because of the process of meta cognitive experience, namely the cognitive feelings that accompany the thought process, such as how easily an information is remembered and processed. It means that cognitive style matter in judgment and decision making.

Research [1] show that disclosure readability influence investor information searching and investment decision. The study implies that investors would be sensitive to credible outside information when the disclosure readability of firm reporting is less presented. Furthermore, it shows consistent behavior investor made an investment decision rely on high readability disclosure. It confirmed previous research [17-22].

### 2.2. Cognitive Style as Moderator

Study [7] presents that individuals determine how they acquire, process, and take decisions on available information. The same information can be processed, perceived and interpreted differently by different individuals. This distinction based on differences in cognitive styles. Cognitive style defined as psychological dimensions representing individual consistency in

collecting and processing information [9]. Cognitive styles associated with individual methods used to collect, analyze, evaluate, and interpret data.

There are many classification and measurement of cognitive style performed by previous researchers. Previous study classifies cognitive styles into two groups, namely field-dependent and field-independent, which is measured using instruments Group Embedded Figure Test (GEFT). Research [23] classifies cognitive styles into two categories, namely intuitive and analytical, measured using the Myers-Brigs Type Indicator (MBTI). Furthermore [24] classify individual cognitive styles into analytical and intuitive as measured using instruments Cognitive Style Index (CSI). Cognitive style relies more on right brain. The characteristics of the right brain are intuitive, integrative, non-linear thinking, a judgment based on feeling, and a broad perspective. While characteristics of the left brain are analytical, logical, sequential information processing, a judgment based on reasoning, and focus on details.

Based on those types and measures of cognitive styles, this study uses cognitive style CSI developed by [24].

Therefore, the hypotheses are formulated as follows:

H1: The interaction of cognitive style and disclosure readability would affect investor information search.

H2: The interaction of cognitive style and disclosure readability would affect investment decision.

## 3. RESEARCH METHOD

### 3.1. Web Experimental Design

This experimental design applied a factorial 2 x 2 between-subjects design. The first factor is disclosure readability (high or low). The second is an individual cognitive style (analytical or intuitive).

### 3.2. Experimental Subjects

Total participants in experiments are 86 participants. The subjects are master students in accounting and management who have taken capital market and financial statement analysis courses. The significance of master students as subjects of experimental substitutes for non-professional/naive investors is considered commensurate in real business settings as well. Subjects were placed randomly into four experimental groups based on the serial login in website experiment.

**3.3. Independent Variables**

The studies have two independent variables: level of disclosure readability and individual cognitive style. The disclosure readability is proxies by corporate web financial reporting: financial data (sales, net income, and earnings per share); presentation management, and corporate action information or other material facts. It has manipulated in two levels, namely: high readability and low readability. In detail, the readability measured follow the SEC's A Plain English Handbook 2010. The second independent variable is cognitive style which measured by Cognitive Style Index (CSI).

**3.4. Dependent Variables**

The two dependent variables are investor information searching behavior and investment decision making. The first dependent variable measured by the amount of outside information access and the second dependent variable was measured using a Likert scale score of 1 = very unsure and 7 = very confident. The 7 Likert scale range used as according to [25] showed 7 Likert scale able to produce the maximum variability and minimal bias.

**3.5. Instruments**

The study employed web-based experiment instrument that was adapted from [1, 22].

**3.6. Experimental Task and Procedure**

This study was designed to complete the task of investor information searching behavior and investor investment decision making on variations in readability of web-based financial reporting and credibility of external information. According to the assignment, the experimental subjects were asked to act as potential investors in the company PT INDOCRAFT Tbk.

In general, the experimental research procedure was carried out through four stages, namely: pilot test, preparation, core experiments, and debriefing.

Before hypotheses testing, this study examined the reliability and validity of CSI instruments. Using Cronbach alpha, this study tested the reliability. Validity test of the instrument was tested by factor analysis items as suggested by [24].

This study determined participants' cognitive style by using the median score split method as in [24]. Subjects whose total value was less than the median cognitive styles (55) categorized as intuitive cognitive style, and if equal to or greater than the median was categorized as cognitive styles analysis. Calculation of median split score of cognitive

styles derived from CSI scores given by the respondents. The higher score indicates that a person's cognitive style is analytical. Conversely, the lower score represents that a person's cognitive style is intuitive.

Hypotheses testing of H1 and H2 were examined using MANOVA.

**4. RESULTS AND DISCUSSION**

**4.1. Descriptive Statistics**

Table 1 shows the descriptive statistics of demography respondents based on gender, age, educational background, and an investment experience.

**Table 1:** Descriptive Statistics of Participants

Demography Characteristics	Frequencies	%
Gender:		
- Male	34	40%
- Female	53	60%
Age:		
- 20 -30	78	93%
- 30 - 37	8	7%
Study Program:		
- Accounting	69	80%
- Management	17	20%
Investment Experience:		
- Yes	40	46%
- No	46	54%
N success manipulation check	86	94%
N failed manipulation check	6	6%

Based on validity and reliability test of instruments, the instrument employed are valid and reliable. The validity of the research instrument was tested using factor analysis. It shows that cognitive style instrument generates good validity with factor loading values > 0.7, while reliability test shows Cronbach alpha 0.936, indicates that cognitive style instrument which was employed in this experiment is reliable.

**4.2. Research Findings**

First hypothesis (H1) predicts that an interaction effect of cognitive style and disclosure readability would affect investor information search. According to Panel A of Figure 1 depicts that an interaction effect between readability and cognitive style while it is statistically not supported as Table 1 (p value = 0.314). It indicates that the

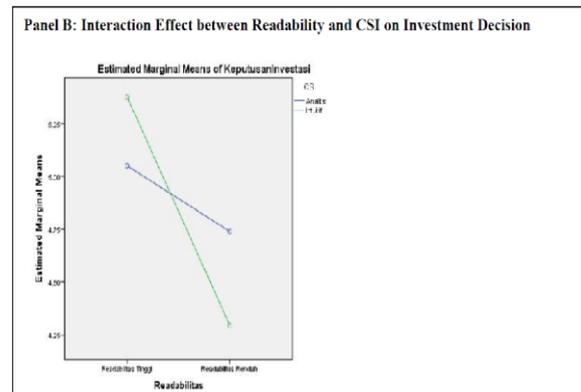
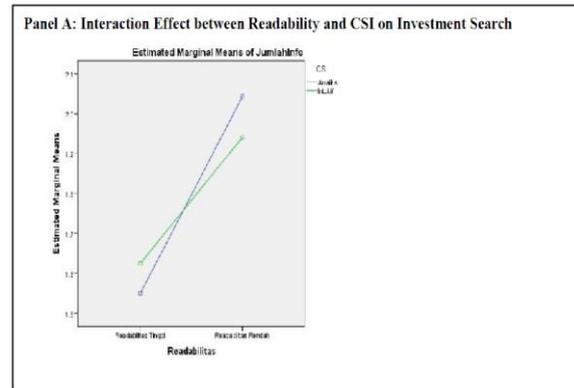
investor cognitive style has not interaction effect with readability and investors information search. Investors information search behavior is not determined by investor cognitive style.

Furthermore, the second hypothesis (H2) predicts that an interaction effect of cognitive style and disclosure readability would affect investment decision. According to Table 1, the result of Manova test show that it is statistically significant at the 99% confidence level (p value = 0.081). In addition, Panel B of Figure 1 depicts that intuitive investors would more confidence on making investment decision when disclosure readability is high compared to analytic investors and it would be less confidence in opposite condition.

**Table 2:** MANOVA Testing Results

Source of Variation	Dependent Variable	F-Stat	p-value*)
Readability	- Amount of information access	4.927	0.015**
	- Investment Decision	3.634	0.030**
CSI	- Amount of information access	0.006	0.421
	- Investment Decision	3.827	0.035**
Readability*CSI	- Amount of information access	0.236	0.314
	- Investment Decision	4.246	0.081**

\*) one-tailed (or equivalent)



**Figure 1, Panel A** graphically depicts observed mean values for participants’ investment search. **Panel B** graphically depicts observed mean values for participant’s investment decision.

### 4.3. Discussion

The result of testing H1 is not supported statistically, while testing H2 is supported. According to H1, it implies that in searching information process, investors both analytic and intuitive tend to be sensitive towards outside information when disclosure readability is low. However, intuitive investors are more confident than analytic investors in making investment decision when disclosure readability is high. These results complement readability of previous research by [22, 1] by considering individual cognitive style.

## 5. CONCLUSION

In this study, the researchers examined how disclosure readability and cognitive style influence investor information search and investment decision. Using MANOVA, the researchers found that cognitive style has no interaction effect towards disclosure readability and information search while it has interaction effect when making investment decision. It implied that firms should be concerned to provide high readability disclosure for both

analytic and intuitive investors as lower disclosure readability for both analytic and intuitive style could make investor rely on other outside information and furthermore have no confidence for making investment decision.

This study is subject to limitation that provides opportunities for future research. First, the researchers give participants access to only limited set of information in order to keep the task manageable. In practice, there are plenty of information (in firm side and outside) which could be accessed. Future work might mitigate this effect by using more complex experimental design.

This study contributes prior literature on human information processing and disclosure readability. While existing study largely focuses on the influence of disclosure readability on information search and investment decision making, this study extends this literature to considering psychological variable, individual cognitive style, which determine investment decision making.

## REFERENCES

- [1]. Alvia, Liza., Hartono, Jogyanto., Ali, M Syaiful., and Nurhayati, Ratna. Internet Financial Reporting Readability and Outside Information Credibility: Investor Valuation Judgment on Digital Disclosure Environment. 2019. SIBR Osaka International Conference Proceeding. SIBR Publishing.
- [2]. R. Subramanian, R. Insley and R. Blackwell, "Performance and Readability: A Comparison of Annual Reports of Profitable and Unprofitable Corporations", *Journal of Business Communication*, vol. 30, no. 1, pp. 49-61, 1993. Available: 10.1177/002194369303000103.
- [3]. J. Courtis, "Readability of annual reports: Western versus Asian evidence", *Accounting, Auditing & Accountability Journal*, vol. 8, no. 2, pp. 4-17, 1995. Available: 10.1108/09513579510086795.
- [4]. L. Bayerlein and P. Davidson, "The influence of connotation on readability and obfuscation in Australian chairman addresses", *Managerial Auditing Journal*, vol. 27, no. 2, pp. 175-198, 2011. Available: 10.1108/02686901211189853.
- [5]. J. Pratt, "The Effects of Personality on a Subject's Information Processing: A Comment", 1980. [Online]. Available: <https://www.jstor.org/stable/246411>. [Accessed: 15- Mar- 2020].
- [6]. F. A. Gul, "The Joint and Moderating Role of Personality and Cognitive Style on Decision Making on JSTOR", *Jstor.org*, 1984. [Online]. Available: <https://www.jstor.org/stable/247298>. [Accessed: 15- Mar- 2020].
- [7]. "Personality: what makes you the way you are", *Choice Reviews Online*, vol. 45, no. 07, pp. 45-4081-45-4081, 2008. Available: 10.5860/choice.45-4081.
- [8]. W. McGhee, M. D. Shields and a. G. Birnberg, "The Effects of Personality on a Subject's Information Processing", 1978. [Online]. Available: <https://www.jstor.org/stable/245675>. [Accessed: 15- Mar- 2020].
- [9]. L. Ausburn and F. Ausburn, "Cognitive Styles: Some Information and Implications for Instructional Design", *Learntechlib.org*, 2020. [Online]. Available: <https://www.learntechlib.org/p/168857/>. [Accessed: 15- Mar- 2020].
- [10]. R. Zajonc, "Attitudinal effects of mere exposure.", *Journal of Personality and Social Psychology*, vol. 9, no. 2, 2, pp. 1-27, 1968. Available: 10.1037/h0025848.
- [11]. L. Jacoby and M. Dallas, "On the relationship between autobiographical memory and perceptual learning.", *Journal of Experimental Psychology: General*, vol. 110, no. 3, pp. 306-340, 1981. Available: 10.1037/0096-3445.110.3.306.
- [12]. R. Reber, P. Winkielman and N. Schwarz, "Effects of Perceptual Fluency on Affective Judgments", *Psychological Science*, vol. 9, no. 1, pp. 45-48, 1998. Available: 10.1111/1467-9280.00008.
- [13]. N. Schwarz, "Metacognitive Experiences in Consumer Judgment and Decision Making", *Journal of Consumer Psychology*, vol. 14, no. 4, pp. 332-348, 2004. Available: 10.1207/s15327663jcp1404\_2.
- [14]. N. Novemsky, R. Dhar, N. Schwarz and I. Simonson, "Preference Fluency in Choice", *Journal of Marketing Research*, vol. 44, no. 3, pp. 347-356, 2007. Available: 10.1509/jmkr.44.3.347.

- [15]. A. Alter and D. Oppenheimer, "Uniting the Tribes of Fluency to Form a Metacognitive Nation", *Personality and Social Psychology Review*, vol. 13, no. 3, pp. 219-235, 2009. Available: 10.1177/1088868309341564.
- [16]. S. Hyunjin, "The Effect of Processing Fluency on Judgment and Processing Style: Three Essays on Effort Prediction, Risk Perception, and Distortion Detection", Dissertation, The University of Michigan, 2015.
- [17]. K. Rennekamp, "Processing Fluency and Investors' Reactions to Disclosure Readability", *Journal of Accounting Research*, vol. 50, no. 5, pp. 1319-1354, 2012. Available: 10.1111/j.1475-679x.2012.00460.x.
- [18]. A. Lawrence, "Individual investors and financial disclosure", *Journal of Accounting and Economics*, vol. 56, no. 1, pp. 130-147, 2013. Available: 10.1016/j.jacceco.2013.05.001 [Accessed 15 March 2020].
- [19]. F. Tang, T. Hess, J. Valacich and J. Sweeney, "The Effects of Visualization and Interactivity on Calibration in Financial Decision-Making", *Behavioral Research in Accounting*, vol. 26, no. 1, pp. 25-58, 2014. Available: 10.2308/bria-50589.
- [20]. H. Tan, E. Wang and B. Zhou, "How Does Readability Influence Investors' Judgments? Consistency of Benchmark Performance Matters", *The Accounting Review*, vol. 90, no. 1, pp. 371-393, 2015. Available: 10.2308/accr-50857.
- [21]. X. Cui, "Calisthenics with Words: The Effect of Readability and Investor Sophistication on Investors' Performance Judgment", *International Journal of Financial Studies*, vol. 4, no. 1, p. 1, 2016. Available: 10.3390/ijfs4010001.
- [22]. H. Asay, W. Elliott and K. Rennekamp, "Disclosure Readability and the Sensitivity of Investors' Valuation Judgments to Outside Information", *The Accounting Review*, vol. 92, no. 4, pp. 1-25, 2017. Available: 10.2308/accr-51570.
- [23]. L. Fuller and S. Kaplan, "A Note about the Effect of Auditor Cognitive Style on Task Performance", *Behavioral Research in Accounting*, vol. 16, no. 1, pp. 131-143, 2004. Available: 10.2308/bria.2004.16.1.131.
- [24]. C. Allinson and J. Hayes, "The Cognitive Style Index: A Measure of Intuition-Analysis For Organizational Research", *Journal of Management Studies*, vol. 33, no. 1, pp. 119-135, 1996. Available: 10.1111/j.1467-6486.1996.tb00801.x..
- [25]. J. Eutsler and B. Lang, "Rating Scales in Accounting Research: The Impact of Scale Points and Labels", *Behavioral Research in Accounting*, vol. 27, no. 2, pp. 35-51, 2015. Available: 10.2308/bria-51219.
- [26]. M. Chan, "The moderating effects of cognitive style and recency effects on the auditors' belief revision process", *Managerial Auditing Journal*, vol. 10, no. 9, pp. 22-28, 1995. Available: 10.1108/02686909510100869.