

Is Alexithymic Individual Truly That Numb? Relationship Between Alexithymia and Loss Aversion Among Early Adulthood

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Abstrak

Berangkat dari penelitian sebelumnya, dihipotesiskan bahwa alexithymia berhubungan dengan toleransi kerugian yang lebih tinggi. Hipotesis ini kemudian diperluas dengan menghubungkannya dengan ciri-ciri kepribadian lain yang terkait dengan pengambilan risiko yang menghasilkan hasil yang serupa. Dalam penelitian ini, asumsi tersebut dievaluasi dengan menggunakan pendekatan yang berbeda terhadap loss aversion dimana loss aversion dalam penelitian ini dilihat sebagai sifat dan bukan sebagai kondisi. kemudian ditemukan bahwa alexithymia dan loss aversion memiliki hubungan yang berarah positif dengan koefisien korelasi Pearson (r) sebesar 0.302 dan p value <0.001 yang diperoleh. Temuan koefisien determinasi (R^2) sebesar 0.0927 juga memperkuat pengaruh alexithymia terhadap loss aversion sedikit. Penjelasan atas hasil yang bertentangan dengan hipotesis sebelumnya serta berbagai kemungkinan penyebabnya juga dibahas dalam penelitian ini.

Kata Kunci: Alexithymia, Penghindaran Kerugian, Pengambilan Keputusan.

Abstract

Departing from Previous research, it was hypothesized that alexithymia is associated with higher loss tolerance. This hypothesis was then extended by linking it to other personality traits related to risk taking which resulted in similar results. In this current study, this assumption is evaluated using a different approach to loss aversion where loss aversion in this research is seen as a trait rather than a state. it was then discovered that alexithymia and loss aversion had a positive directional relationship along with the Pearson correlation coefficient (r) of 0.302 and p value <0.001 obtained. The finding on a coefficient of determination (R^2) of 0.0927 also strengthens the influence of alexithymia on loss aversion by a bit. Explanations for results that are contrary to the previous hypothesis as well as various possible causes are also discussed in this research.

Keywords : Alexithymia, Loss Aversion, Decision Making.

INTRODUCTION

Everyday life comprises a series of outcomes derived from the decisions individuals make. Consequently, a comprehensive understanding of the information that supports expected utility in decision-making is essential, and with the increasing complexity of information encountered throughout life, the ability to make rational decisions and mitigate biases becomes increasingly crucial (Brust-Renck et al., 2021). However, humans often exhibit unreliability in this regard (Kahneman, 2011).

Humans evince bounded rationality (Simon, 1955), which can lead to tendencies such as loss aversion which implies that losses loom larger than gain (Yao & Li, 2013), founded by Kahneman and Tversky (1979, 1984). Such a simple phenomenon capable of significantly influence the decision-making process even predicting one's possible behavior upon risky nor riskless choice (Tversky & Kahneman, 1992), which

commonly referring to dissatisfactory or unfavorable condition along with increases in loss aversion tendencies (Kahneman, 2011).

Decision making is heavily influenced by emotion (Lerner et al., 2015) and so does loss aversion (Kahneman, 2011). Accordingly, competence in emotional processing (Bibby & Ferguson, 2011), comprehension of contextual information (Mrkva et al., 2020) and cognitive processing capability (Clay et al., 2017) contribute a major role in forming loss aversion tendencies and differences among people. Pertaining to that, there is a personality trait which could exert unique influence on this ability while also allegedly capable in predicting a loss aversion tendency upon some individual, namely alexithymia (Bibby & Ferguson, 2011).

Based on previous research, alexithymia is associated with higher loss tolerance (low loss aversion) (Ferguson et al., 2009) and a consistent tendency to make detrimental decisions in the IGT (Iowa Gambling Task) treatment (Zhang et al., 2017). The hypothesis was then extended by exploring the alleged relationship that exists between loss aversion and alexithymia when traits associated with risk taking such as 'sensation seeking' and other (Big 5) personality traits are controlled for (Bibby & Ferguson, 2011). Subsequently it was found that the higher the alexithymia score, the lower the loss aversion, even when sex, sensation seeking, and other personality traits were taken into account.

In those research, loss aversion was observed using the Iowa Gambling Task (IGT) and WTA/WTP instruments, which in fact measure the level of loss aversion based on one of post-treatment-behavioral marker (or state) of loss aversion rather than a person's genuine psychological traits or tendencies, while loss aversion indeed originally recognize as traits rather than a state (Lejarraga & Hertwig, 2022). This opens up the opportunities for interesting discussions upon this topic considering that loss aversion itself is still minimally discussed and studies about it should be expanded (Mukherjee, 2019).

Loss aversion is known to play a major role in the study of human decision making as it was a Nobel laureate's topic. However, so far loss aversion has often been studied through experimental models that reveal its condition without ever touching the level of individual traits (Saefudin, 2022). Build upon that gap, this research aims to address it by exploring the alleged relationship that exists between alexithymia and loss aversion from a trait centered approach which is relatively novel to the topic. By doing so, hopefully this paper could contribute a fresh insight for science related to the topic of loss aversion, alexithymia and decision making in general.

In the other hand, the early adult development phase, ranging from 18-29 years, is a transitional period towards adulthood (Arnett et al., 2014). During this time, individuals gain independent decision-making abilities that were previously restricted, such as decisions related to alcohol and tobacco use, medical treatment, investing in the stock market, abortion, and voting for political candidates. The meet of novel experience of independence along with responsibility makes decision making in this stage of life is trickier (Halpern-Felsher et al., 2016; Icenogle & Cauffman, 2021; Strough & Bruine De Bruin, 2020). Poor judgment and decision-making during this phase can lead to behavioral issues like drug abuse, promiscuity, reckless driving, crime, and other forms of impulsive and risky behavior, often accompanied by mental health problems (Dansereau et al., 2013).

Given to large prevalence of prospective subject, individuals aged 18-29 (Arnett et al., 2014) have been selected as the criteria for this research as it considered to possibly represent a common population the best while being in a relatively ideal position (neither too young nor too old). This choice also accounts for the demarcation of the study, which would not be feasible to accurately encompass and represent larger and more diverse population groups.

METHOD

Instrumentation

Loss aversion

Loss aversion in this research is defined as an individual's tendency to be reluctant to experience losses through excessive psychological weighting of the stimulus of loss compared to the equal stimuli of gain. Regarding to that, loss aversion was observed through its 3 main components i.e. affective, cognitive, and conative according to Paraschiv & L'Haridon (2008). Neural component was excluded due to its irrelevance

and observational limitations. Loss aversion in this study was a typical psychological scale instrument containing 18 item with Likert's 7-point response format ranging from strongly disagree (1)—neutral (4)—to strongly agree (7).

Alexithymia

Alexithymia is defined as an individual personality characteristic regarding a person's limited ability to understand and express emotions. Alexithymia in this study will be measured using the Perth alexithymia scale (PAQ) by Preece et al. (2018) which refers to its 3 components of difficulty identifying feelings (DIF), difficulty describing feelings (DDF), and external-oriented thinking (EOT). PAQ in this study also using the 7-point Likert's response format.

Validity and Reliability

Loss aversion

A literature review related to the topic of loss aversion was previously performed, before finally the loss aversion scale instrumentation was constructed and then discussed repeatedly with the thesis supervisor; Nikmah Sofia Afiati. After the content in the scale was deemed to be sufficient to represent loss aversion, a preliminary test along with reliability test was implemented towards the instrument. The test results indicates an alpha Cronbach's value of 0.923 with a discrimination power index (r_{ix}) of >0.4 for each item, which illustrates good overall internal consistency and reliability.

Alexithymia

PAQ is chosen was selected over TAS-20 due to its comprehensive coverage of alexithymia's dimensions and its demonstrated psychometric properties in recent research (Preece et al., 2018). Preliminary testing of the scale that conducted in this research also showed that the scale had good power of discrimination between item ($r_{ix}>0,5$) and overall reliability ($\alpha=0.967$) which indicates that the instrument was adequate and ready to use.

Participant

In the preliminary test, a convenience sample of 76 individuals within age range of 18-29 years old with various background was participated, data was collected through a snowball sampling method which later is used for the test of reliability and validity. Furthermore, the final amount of collected data was 112 participants (males=40, Females=72) who came from the same use of method upon different group of subjects regardless to the preliminary test.

Procedure

The research process commenced with an extensive review of literature relevant to the study topic and title. This included examining various sources through literature studies, observations, and interviews. Based on these findings, a rationale was developed and discussed with the thesis advisor to ensure the study's direction and methodology were well-defined.

Following the literature review, the research instruments for measuring alexithymia and loss aversion were constructed. On April 24, 2024, these instruments underwent a validity assessment conducted by Nikmah Sofia Afiati as a thesis advisor. This validation confirmed the tools' accuracy and appropriateness for the research.

Preliminary tests were implemented upon the instrument. On May 25, 2024, the scales were distributed to potential subjects via Google Form. Data was collected from 76 respondents, and the data obtained was then analyzed for reliability which ultimately resulted in good suitability because it exceeded certain specified thresholds as explained before.

Once the trial is complete, the main study continues. The final version of the scale was distributed to a new group of subjects, different from the experimental subjects using a different Google Form's URL. Its spread also occurs through social media platforms. Data collection was held starting from 7 June to 16 June 2024.

The data collected was then analyzed using statistical software, including the analysis of descriptive, assumption, hypothetical and additional test to ensure and enrich the insight form data. The results will be discussed in the next section.

RESULT

Descriptive statistics

The following table are the results of the data obtained and explained descriptively.

Table 1. Descriptive

Variable	Hypothetic				Empiric			
	Score		mean	SD	Score		mean	SD
	min	max			min	max		
Alexithymia	24	168	96	24	24	168	92,2	30.3
Loss aversion	18	126	72	18	32	122	83,6	18.7

The table contains a set of hypothetical data and the empirical results obtained. Subsequently, the data is calculated and compiled into 3 categories i.e. low, medium, high. Description of categorization upon each variable resulting in the following table.

Table 2. Categorization table of Alexithymia

Category	Guide	Hypothetic		Empiric	
		N	%	N	%
High	$X \geq (\mu + 1\sigma)$	20	16,39%	17	13,93%
Medium	$(\mu - 1\sigma) \leq X < (\mu + 1\sigma)$	60	53,57%	72	64,28%
Low	$X < (\mu - 1\sigma)$	32	26,22%	23	18,85%

Based on the guidelines of the table above, the levels of alexithymia in the hypothetical and empirical categorization share relatively similar proportions, where overall subjects in this study had moderate levels of alexithymia (64.28%) and slightly tended to be low (18.85% > 13.93% (high)) while loss aversion in the other hand is not much different.

Table 3. Categorization Table of Loss aversion

Category	Guide	Hypothetic		Empiric	
		N	%	N	%
High	$X \geq (\mu + 1\sigma)$	42	37,5%	16	13,11%
Medium	$(\mu - 1\sigma) \leq X < (\mu + 1\sigma)$	64	52,45%	83	68,03%
Low	$X < (\mu - 1\sigma)$	6	4,91%	13	10,65%

Accordingly, the proportion of loss aversion levels in the subjects of this study also tends to be moderate (68.03%) and slightly high (13.11% > 10.65% (low)). However, the results of the empirical categorization are quite deviant when compared to its hypothetical category, by the number of subjects being categorized as ‘high’ in the hypothetical formulation compared to the empirical one (37.5% > 13.11%). These findings are enriching the discussion in the next section.

Assumption test

The data normality assumption test was implemented by referring to the Shapiro-Wilk parameters, obtained in the table below.

Table 4. Assumption Test

	N	Shapiro-Wilk	
		W	p
Loss aversion	112	0.980	0.099
Alexithymia	112	0.985	0.265

Based on the test results table, alexithymia obtained a p value of 0.0265 (>0.05) and loss aversion of 0.099 (>0.05), which means that both data are normally distributed.

Hypothesis test

By the finding of normally distributed data then the parametric assumption is fulfilled. Subsequently, the Pearson’s correlation was implemented upon the variables by intend to analyze the alleged relationship that exists between the variable’s alexithymia and loss aversion. Following are the results obtained

Table 5. Hypothesis Test

		Alexithymia	Loss aversion
Alexithymia	Pearson's r	—	
Loss aversion	Pearson's r	0.302 **	—
	df	110	—
	p-value	0.001	—

The test results table shows that there is a significant positive relationship at the 0.001 level (r: 0.302 & p-value: 0.001) between alexithymia and loss aversion. This is contrary to the previously assumed hypothesis which stated that there is a negative relationship between the two variables. This finding will be discussed in greater detail in the subsequent section.

Additional Analysis

Additional linear regression analysis was conducted to examine the effective contribution of the alexithymia variable upon loss aversion.

Table 6. Model Fit Measures

Model	R	R ²	Overall Model Test			
			F	df1	df2	p
1	0.302	0.0910	11.0	1	110	0.001

The results of the linear regression analysis in the table show a coefficient of determination (R²) of 0.0910, which means that alexithymia is proven to be influencing loss aversion at a degree of 9.10%.

DISCUSSION

This study aimed to explore the relationship between alexithymia and loss aversion among early adult subjects aged 18-29 years (Arnett et al., 2014). The hypothesis posited a negative relationship between the two based on rationalization which heavily influenced by previous research (Bibby & Ferguson, 2011). Through the Pearson’s correlation analysis, the data showed a correlation coefficient of r=0.302** and a p-value of <0.001. This indicates a positive relationship between alexithymia and loss aversion among the 112 early adult subjects in this study, which contradicts the initial hypothesis.

There are various possible factors contributing to this discrepancy, such as the presence of extraneous variables in the study, an unrepresentative sample, inadequate scale accuracy, and the relevance of previous research to the present context (Crawford, 2014). These issues will be discussed in this section.

As an overview, most subjects in this study were found to have a moderate level of loss aversion in both hypothetical (52.45%) and empirical (68.03%) categorizations. This indicates a common level of fear or avoidance of loss in general, which may exhibit different dynamics in different contexts (Kahneman, 2011) and might be heavily influenced by the knowledge and information processing abilities of the subjects upon the context (Clay et al., 2017; Mrkva et al., 2020; Yao & Li, 2013), as well as their emotional regulation (Bibby & Ferguson, 2011). On the other hand, most subjects in this study also had a moderate level of alexithymia. This indicates that most subjects in this study tend to have difficulties understanding, describing, and 'connecting' with personal or surrounding feelings (Taylor & Bagby, 2000; Timoney & Holder, 2013)

Through statistical calculations, those two characteristics have a positive relationship represented by their variables correlation and were found to be contrary to the proposed hypothesis in this study. This is possibly due to the presence of extraneous variables in this study, which is understandable given that this study model does not involve controlled conditions like experimental studies. This can also be supported by the possibility that the subjects are not representative in terms of number or criteria (Crawford, 2014). This becomes clearer when examining previous research.

Research by Bibby & Ferguson (2011) involved sensation seeking, extraversion, and other personality dimensions. In that study, it was found that alexithymic individuals with sensation seeking and extraversion tend to have higher acceptance of potential losses, which is then interpreted as a reduction in loss aversion as these traits (alexithymia, sensation seeking, and extraversion) increase. This illustrates that additional variables may be needed as prerequisites for alexithymia and loss aversion to be negatively correlated. This leads to the finding of an anomaly.

Loss aversion is known as 'loss loom larger than gain' or the fear of loss that exceeds the enthusiasm for equivalent gains psychologically, which initially found through the asymmetry of weighting between gain-loss stimuli (Kahneman, 2011). Measurement of loss aversion at that time and generally today, uses WTA/WTP instruments or other 'gambling' tasks like the Iowa Gambling Task (IGT), which measure the end result or a post-treatment-behavioral marker (state) which does not illustrate its psychological basis (traits) (Georgantzís & Navarro-Martínez, 2010). Meanwhile, in this study, loss aversion was measured using a psychological scale that measures the psychological trait or tendency (Azwar, 2017), making a difference in results very possible.

The discussion regarding state vs trait of loss aversion was previously a heated topic, which concluded that loss aversion is more of a 'trait' when referring to its standard concept in Kahneman and Tversky (1979) (Lejarraga & Hertwig, 2022). This indicates that the different directions of hypotheses between this study compared to previous studies provide some insight that worth to be further examined.

Kahneman in his book (thinking fast and slow) highlights the common confusion among the public regarding to the implications of loss aversion, which was then clarified that loss aversion is more of a trait that does not always promote risk avoidance actions but can also promote risk taking—if the options presented to the subject are perceived as sufficient lose-lose condition for that (Kahneman, 2011).

In a study by Ferguson et al. (2009), Bibby and Ferguson (2011), and Zhang et al. (2017) loss aversion is concluded through the subject's willingness to take risky or even detrimental actions after being given a gambling task (IGT, WTA/WTP). which is then interpreted as a decrease in loss aversion, which at the trait level might not be appropriate.

As explained, increased loss aversion can also promote risk-taking actions if the options are perceived as a lose-lose condition by the subjects, thus might triggering the self defense mechanisms and potentially encouraging risk-taking behavior (Kahneman, 2011). In the context of alexithymia, it is suspected that the subjects' unreliability in recognizing emotional stimuli in the psychological context of gain-loss choices may limit their understanding, which resulting in the increasing of aversion to loss (loss aversion) and triggering unexpected responses such as risk-taking behavior (Chen et al., 2023; Zhang et al., 2017). The subject's difficulty in communicating their understanding of the psychological aspects of gain-loss concepts, coupled with their tendency towards an external cognitive style, might also strengthen the 'framing' towards the presented options (Kahneman & Tversky, 1984) given as something not fully

understood and increase the aversion to loss (loss aversion), as seen in the post-treatment conditions or data in the study by Bibby & Ferguson (2011), whose results are quite counter-intuitive.

As far as can be discussed in this study, alexithymia and loss aversion which observed in a trait-centered manner, resulting a positive form of relationship between the two as depicted in this study. Meanwhile, observing the apparent behavior marker (state) of post-treatment on loss aversion can resulting in an direction of negative relationship as found in previous studies.

Ultimately, what was revealed in this study is that alexithymia and loss aversion have a significantly positive relationship rather than a negative one, as it was also found that alexithymia has a coefficient of determination (R^2) of 0.0910, meaning alexithymia influences loss aversion tendencies by 9.10%. This is likely to occur through the limited emotional comprehension ability of alexithymic subjects, which then manifests as a fear of loss.

Additionally, this study also highlights the discrepancy between hypothetical and empirical categorization results, where, following the empirical normal curve, the prevalence of subjects with 'high' loss aversion categorization is relatively less compared to its hypothetical normal curve. This is because the norm of human loss aversion is observed to be higher from the start (Kahneman, 2013) and depicted by mean calculations. Therefore, the calculation of loss aversion based on the mean tends to underestimate the level of loss aversion at the median value, which in some literature is considered more representative (Abdellaoui et al., 2007).

CONCLUSION

In conclusion, the positive relationship between alexithymia and loss aversion found in this study challenges previous assumptions and suggests that the emotional regulation difficulties associated with alexithymia may play a crucial role in shaping loss aversion tendencies. Future research should aim to replicate these findings with larger, more representative samples and consider additional variables that may influence this relationship.

REFERENCE

- Abdellaoui, M., Bleichrodt, H., & Paraschiv, C. (2007). Loss Aversion Under Prospect Theory: A Parameter-Free Measurement. *Management Science*, 53(10), 1659–1674. <https://doi.org/10.1287/mnsc.1070.0711>
- Arnett, J. J., Žukauskienė, R., & Sugimura, K. (2014). The new life stage of emerging adulthood at ages 18–29 years: Implications for mental health. *The Lancet Psychiatry*, 1(7), 569–576. [https://doi.org/10.1016/S2215-0366\(14\)00080-7](https://doi.org/10.1016/S2215-0366(14)00080-7)
- Azwar, S. (2017). *Penyusunan skala psikologi* (Ed. II, cet. XII). Pustaka Pelajar.
- Bibby, P. A., & Ferguson, E. (2011). The ability to process emotional information predicts loss aversion. *Personality and Individual Differences*, 51(3), 263–266. <https://doi.org/10.1016/j.paid.2010.05.001>
- Brust-Renck, P. G., Weldon, R. B., & Reyna, V. F. (2021). Judgment and Decision Making. In P. G. Brust-Renck, R. B. Weldon, & V. F. Reyna, *Oxford Research Encyclopedia of Psychology*. Oxford University Press. <https://doi.org/10.1093/acrefore/9780190236557.013.536>
- Chen, X., Wu, Z., Zhan, B., Ding, D., & Zhang, X. (2023). Effects of Alexithymia on Moral Decision-Making in Sacrificial Dilemmas: High Alexithymia is Associated with Weaker Sensitivity to Moral Norms. *Psychology Research and Behavior Management*, Volume 16, 2315–2325. <https://doi.org/10.2147/PRBM.S407744>
- Clay, S. N., Clithero, J. A., Harris, A. M., & Reed, C. L. (2017). Loss Aversion Reflects Information Accumulation, Not Bias: A Drift-Diffusion Model Study. *Frontiers in Psychology*, 8, 1708. <https://doi.org/10.3389/fpsyg.2017.01708>
- Crawford, M. (2014). Strengths and Limitations of Correlational Design. Unpublished. <https://doi.org/10.13140/RG.2.1.4195.7920>
- Dansereau, D. F., Knight, D. K., & Flynn, P. M. (2013). Improving adolescent judgment and decision making. *Professional Psychology: Research and Practice*, 44(4), 274–282. <https://doi.org/10.1037/a0032495>

- Ferguson, E., Bibby, P. A., Rosamond, S., O'Grady, C., Parcell, A., Amos, C., McCutcheon, C., & O'Carroll, R. (2009). Alexithymia, Cumulative Feedback, and Differential Response Patterns on the Iowa Gambling Task. *Journal of Personality*, 77(3), 883–902. <https://doi.org/10.1111/j.1467-6494.2009.00568.x>
- Georgantzis, N., & Navarro-Martínez, D. (2010). Understanding the WTA–WTP gap: Attitudes, feelings, uncertainty and personality. *Journal of Economic Psychology*, 31(6), 895–907. <https://doi.org/10.1016/j.joep.2010.07.004>
- Halpern-Felsher, B., Baker, M., & Stitzel, S. (2016). Decision-Making in Adolescents and Young Adults. In M. A. Diefenbach, S. Miller-Halegoua, & D. J. Bowen (Ed.), *Handbook of Health Decision Science* (hlm. 157–167). Springer New York. https://doi.org/10.1007/978-1-4939-3486-7_12
- Icenogle, G., & Cauffman, E. (2021). Adolescent decision making: A decade in review. *Journal of Research on Adolescence*, 31(4), 1006–1022. <https://doi.org/10.1111/jora.12608>
- Kahneman, D. (2011). *Thinking, fast and slow* (1st ed). Farrar, Straus and Giroux.
- Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, 47(2), 263. <https://doi.org/10.2307/1914185>
- Kahneman, D., & Tversky, A. (1984). Choices, values, and frames. *American Psychologist*, 39(4), 341–350. <https://doi.org/10.1037/0003-066X.39.4.341>
- Lejarraga, T., & Hertwig, R. (2022). Three Theories of Choice and Their Psychology of Losses. *Perspectives on Psychological Science*, 17(2), 334–345. <https://doi.org/10.1177/17456916211001332>
- Lerner, J. S., Li, Y., Valdesolo, P., & Kassam, K. S. (2015). Emotion and Decision Making. *Annual Review of Psychology*, 66(1), 799–823. <https://doi.org/10.1146/annurev-psych-010213-115043>
- Mrkva, K., Johnson, E. J., Gächter, S., & Herrmann, A. (2020). Moderating Loss Aversion: Loss Aversion Has Moderators, But Reports of its Death are Greatly Exaggerated. *Journal of Consumer Psychology*, 30(3), 407–428. <https://doi.org/10.1002/jcpy.1156>
- Mukherjee, S. (2019). Revise the Belief in Loss Aversion. *Frontiers in Psychology*, 10, 2723. <https://doi.org/10.3389/fpsyg.2019.02723>
- Paraschiv, C., & L'Haridon, O. (2008). Loss Aversion: Origin, Components and Marketing Implications. *Recherche et Applications En Marketing (English Edition)*, 23(2), 67–82. <https://doi.org/10.1177/205157070802300204>
- Preece, D., Becerra, R., Robinson, K., Dandy, J., & Allan, A. (2018). The psychometric assessment of alexithymia: Development and validation of the Perth Alexithymia Questionnaire. *Personality and Individual Differences*, 132, 32–44. <https://doi.org/10.1016/j.paid.2018.05.011>
- Saefudin, M. arif. (2022). Konstruksi Skala Loss aversion (SLA) (<https://etd.repository.ugm.ac.id/penelitian/detail/208052>) [Universitas Gajah Mada]. <http://etd.repository.ugm.ac.id/>
- Simon, H. A. (1955). A Behavioral Model of Rational Choice. *The Quarterly Journal of Economics*, 69(1), 99. <https://doi.org/10.2307/1884852>
- Strough, J., & Bruine De Bruin, W. (2020). Decision Making Across Adulthood. *Annual Review of Developmental Psychology*, 2(1), 345–363. <https://doi.org/10.1146/annurev-devpsych-051120-010038>
- Taylor, G. J., & Bagby, R. M. (2000). An overview of the alexithymia construct,”. in *Handbook of Emotional Intelligence* (hlm. 41–67). eds Bar-On R., Parker J. D. A.
- Timoney, L. R., & Holder, M. D. (2013). Emotional Processing Deficits and Happiness: Assessing the Measurement, Correlates, and Well-Being of People with Alexithymia. Springer Netherlands. <https://doi.org/10.1007/978-94-007-7177-2>
- Tversky, A., & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Kluwer Academic Publisher*, 5:297-323. <http://www.jstor.org/stable/41755005>
- Yao, J., & Li, D. (2013). Bounded rationality as a source of loss aversion and optimism: A study of psychological adaptation under incomplete information. *Journal of Economic Dynamics and Control*, 37(1), 18–31. <https://doi.org/10.1016/j.jedc.2012.07.002>

Zhang, L., Wang, X., Zhu, Y., Li, H., Zhu, C., Yu, F., & Wang, K. (2017). Selective impairment of decision making under ambiguity in alexithymia. *BMC Psychiatry, 17*(1), 378. <https://doi.org/10.1186/s12888-017-1537-2>