

【論 文】

The effects of *cognitive bias* on academic success: The case for returnee learners of TOEFL iBT®

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Abstract : The goal of this study is primarily to find out ways to help students learn to recognize that various *cognitive biases* could impact their thinking and make adjustments as needed. Specifically, the study aims to identify significant biases and search *debiasing* methods that could promote the acceptance of returnee learners of English who have studied overseas. Using the psychological approach, the author investigated eleven *cognitive bias* traits assumingly characteristic of returnee learners of TOEFL iBT® and correlations between *cognitive bias* factors and their academic success. Multiple regression analysis was used to examine detrimental effects of *cognitive bias* on academic performance. Two main findings were obtained for correlations between 11 *cognitive biases* and participants' test scores. *Choice-supportive bias* and *outcome bias* had positive correlations with learners' test scores in terms of learner psychology while *reactance bias* was found to have a significantly negative impact on learning effects. It was found out that *cognitive biases* could work both positively and negatively and that certain *cognitive biases* and academic success are compatible. These findings have some pedagogical implications. Teachers can make use of the findings of the study in helping learners enhance learners' motivation, confidence and self-esteem by positively exploiting certain *cognitive biases* in their instructions and mitigate detrimental bias traits which could adversely influence learners' academic performances with careful *debiasing* guidance.

Keywords : cognitive bias, debias, TOEFL iBT®, returnee

1. Introduction

In terms of learner autonomy, *cognitive bias* is the opposite of *metacognition*. It is possible that learners are making cognitive errors in their own thinking and it is hindering their learning. *Metacognition* works best when learners incorporate awareness of possible bias and errors in their cognitions. In other words, in order to be successful in learning, it is not enough to just be metacognitive, but learners must also be aware of possibilities they might be relying on a biased interpretation of their learning. On the premises that they have negative influences on their learning effects in terms of learner psychology, this paper empirically examines *cognitive bias* traits relevant with academic success in the context of TOEFL iBT® and explores *debiasing* methods that could promote the acceptance of returnee learners and ways to guide them to academic success on the basis of the previous literature in cognitive psychology.

1.1 Cognitive bias

First of all, it is necessary to clarify and elaborate on the concept of “*cognitive bias*” for vocabulary knowledge. By definition, a *cognitive bias* is a systematic pattern of deviation from norm or rationality in judgment (Haselton et al., 2005). First coined by Amos Tversky and Daniel Kahneman (1974), cognitive biases are considered to be errors in thinking that can lead to a misinterpretation of information, affecting the accuracy of our decisions and the rationality of our judgements. Since the introduction of the concept of *cognitive bias*, there has been a considerable amount of research conducted into this psychological field. Various researchers and psychologists have weighed on what they believe constitutes a *cognitive bias*. There are over 50 *cognitive biases* that psychologists consider when they examine thinking (See Table 1).

Table 1 Taxonomy of cognitive biases in psychology

Decision-making and behavior
<i>Bandwagon effect / Confirmation bias / Congruence bias / Contrast effect / Distinction bias / Endowment effect / Extreme aversion / Focusing effect / Framing effect / Illusion of Control / Impact bias / Information bias / Loss aversion / Mere exposure effect / Neglect of probability / Omission bias / Outcome bias / Ostrich effect / Planning fallacy / Reactance / Status quo bias / Zero-risk bias</i>
Probability
<i>Ambiguity effect / Anchoring / Attentional bias / Availability heuristic / Availability cascade / Clustering illusion / Conjunction fallacy / Exaggerated expectation / Gambler's fallacy / Hawthorne effect / Hindsight bias / Hot-hand fallacy / Illusory correlation / Ludic fallacy / Neglect of prior base rates effect / Ludic fallacy / Neglect of prior base rates effect / Optimism bias / Overconfidence effect / Positive outcome bias / Primacy effect / Recency effect / Repetition bias / Stereotyping</i>
Attribution
<i>Actor-observer bias / Dunning-Kruger effect / Egocentric bias / Empathy gap / Forer effect / Fundamental attribution error / Halo effect / Illusion of asymmetric insight / Ingroup bias / Projection bias / Restraint bias / Self-serving bias / Self-fulfilling prophecy / Trait ascription bias</i>
Memory
<i>Beneffectance / Choice-supportive bias / Continued influence effect / Consistency bias / Cryptomnesia / Egocentric bias / Suggestibility</i>

Note: On the basis of the research book by Kisak (2015), cognitive bias items were categorized into four subscales by the author.

Among over 50 cognitive bias theories, 11 bias theories were selected by the author in relevance with participants. The current study merely focuses on eleven biases in bold which the author assume are most commonly associated with returnee learners' psychology from the pedagogical perspective (See Table 2). On speculation, those eleven selected cognitive bias traits seem to be most typical of returnee learners of English in terms of learner psychology, namely, overconfidence, pridefulness, self-reliance, freedom of choice, wishful thinking, causal attribution and memory errors, and consequently seem to have an impact on their academic performances.

Table 2 *Leading proponents & Definitions of 11 cognitive biases chosen*

<i>Decision-making & behavior</i>		
1. <i>Outcome bias</i>	Baron, J., & Hershey, J. C.	The decision based on the outcome of previous events, without regard to how the past events developed (Baron & Hershey, 1988).
2. <i>Ostrich effect</i>	Galai, D. & Sade, O.	The avoidance of apparently risky financial situations by pretending they do not exist (Galai & Sade, 2006).
3. <i>Planning Fallacy</i>	Kahneman, D., & Lovallo, D.	The tendency to underestimate the time, costs, and risks of future actions and at the same time overestimate the benefits of the same actions. (Kahneman & Lovallo, 2003)
4. <i>Reactance</i>	Brehm, J. W.	The motivation to regain a freedom after it has been lost or threatened (Brehm, 1989).
5. <i>Status quo bias</i>	Samuelson, W., & Zeckhauser, R.	The preference for the maintenance of one's current or previous state of affairs (Samuelson & Zeckhauser, 1988).
Probability		
6. <i>Exaggerated expectation</i>	Hilbert, M.	The tendency to expect or predict more extreme outcomes than those outcomes that actually happen (Hilbert, 2012).
7. <i>Optimism bias</i>	Weinstein, N. D.	The tendency for people to believe that they are less likely to experience negative events and more likely to experience positive events than are other people. (Weinstein, 1980)
Attribution		
8. <i>Dunning-Kruger effect</i>	Dunning, D., Johnson, K., Ehrlinger, J., and Kruger, J.	A cognitive bias in which people wrongly overestimate their knowledge or ability in a specific area (Dunning et al., 2003).
9. <i>Self-serving bias</i>	Larson, J. R.	The tendency to perceive oneself in an overly favorable manner (Larson, 1977).
Memory		
10. <i>Choice supportive bias</i>	Lind, M., Visentini, M., Mäntylä, T., & Del Missier, F.	The tendency to retroactively ascribe positive attributes to an option one has selected and/or to demote the forgone options (Lind et al., 2017).
11. <i>Continued influence</i>	Johnson, H. M., & Seifert, C. M.	The tendency for misinformation to continue to influence memory and reasoning about an event (Johnson & Seifert, 1994).

1.2 Debiasing Approach

“Debiasing” is also referred to using other terms, such as *Cognitive Bias Modification*, *cognitive bias mitigation*, *cognitive bias reduction*, is the prevention and reduction of the negative effects of cognitive biases, particularly with respect to judgment and decision making (Morewedge et al., 2015). To put it differently, *debiasing* is a process through which the influence of *cognitive*

biases is reduced, generally with the goal of helping people think in a more rational and optimal manner. Through a debiasing process, a person may learn or adopt better strategies by which to make judgments and decisions (Larrickcs, 2004). There are three general approaches to debiasing judgment and decision making, and the costly errors with which biased judgment and decision making is associated: changing incentives, nudging, and training. Since part of the research aim is to identify significant biases and search effective *debiasing* methods from the educational point of view, the discussion involves prescriptive *debiasing* guidance referring to the debiasing theory as proposals in academic disciplines. Participants were asked to examine their own biases in the questionnaire before conducting lessons in the hope that this process would help them develop awareness of their own biases in their thinking and in turn help guide their future thinking and behaviors.

2. Method

2.1 Research participants

High school participants were drawn from among those the author individually gave instructions on TOEFL iBT[®] through a number of private lessons (12~36 lessons). The participants were 33 high school Japanese students (16 males, 17 females), between the age of 15 and 18, who attended either local high school (no ESL or EFL classes involved) or international school overseas attended or unattended by parents, where all class lessons were conducted in English. They all attended local high schools or international schools in such countries as U.S.A. (17), Thailand (5), Germany (4), Canada (3), U.K (1), Brazil (1), France (1), Singapore (1). The students completed a self-report questionnaire which focused on finding out the degree of cognitive bias traits in learning. They all needed TOEFL iBT[®] score in order to prove their competence in English in applying for Japanese universities as returnee applicants. The number of TOEFL iBT[®] they actually took vary ranging from three to six times.

2.2 Academic achievements and Data Collection

As a measure to assess participant learners' leaning effects and academic success, the TOEFL iBT[®] test was employed for the following reasons. First, they all took the test multiple times and the test was suited to know their learning effects. Next, TOEFL iBT[®] was most commonly taught by the author in instructing returnee high school learners and their data was the largest in number. Besides, TOEFL iBT[®] is a high-stakes test which measures the abilities of test-takers in four language skills and suited to know their comprehensive English language skills at the higher education level. As for academic achievements, all participants were assessed individually according to their test results so that their learning effects can be measured. Score data were drawn from among those who took the test more than twice and their learning period varied from three months to twelve months. The experiment took place at a preparatory school where the author taught as a part-time English instructor. A series of private lessons (12~36) were given either face to face or online (Skype)

individually. Participants were asked to report their latest score detailed in each section of TOEFL iBT® composed of four sections in which 30 is given as a full score: reading, listening, speaking and writing, totaling 120 as a full score. The author kept track of every participant's test results in detail and made detailed analysis of their academic improvements in scores as learning effects. The highest total scores of each participant were used for the multiple regression analysis as measures of their academic success. Their total scores of TOEFL iBT® ranged from 60 to 111. The mean score was 82.1.

2.3 Ethics Statement

The aim of this questionnaire survey is to measure learners' inclination and their learning effects. The questionnaire is answered on online questionnaire form (Google Form). The author asked each respondent on the first page of the form a consent to the use of survey results and their score data for the purpose of research only. It was explained to them that careful considerations were taken in order to protect respondents' privacy and survey results were to be anonymous in the paper. All participants gave their informed consents before taking part in the study.

2.4 Measures for Learner's Cognitive Bias

After providing consents, the participating learners were asked to complete the questionnaire and answer questions provided by the author which specifically focused on finding out the degree of cognitive bias in learning (See Table 3). The survey questionnaire is generally based on the work of P. F. Kisak (2015). In order to measure the degree of cognitive bias, eleven items, which the author assume are relevant in autonomous learning, were used in the questionnaire. The scales of the questionnaire comprised the five-point Likert type statements ranging from [1], the least accurate, to [5] the most accurate. The goal of these questions was to help students think about ways their own cognitive errors may be contributing to their learning and scores. Cognitive bias question items in the questionnaire were reduced to about one-fifth in number because fewer number of questions would not adversely affect participants' motivation in learning and also answering over 50 cognitive bias item questions might have affected the qualities of their answers.

Table 3 11 Questionnaire item

Decision-making and behavioral biases
“I place much importance on the final outcome rather than an assessment of the time and quality of previous learning.” (<i>Outcome bias</i>)
“I tend to avoid or ignore unfavorable information including negative feedbacks and undesirable outcomes.” (<i>Ostrich effect</i>)
“I tend to underestimate the time needed to complete future tasks in learning.” (<i>Planning fallacy</i>)
“When negative feedbacks are given or learning methods are forcefully regulated by the teacher, I tend to react against suggestions given even if they seem to be good ones and try to maintain my own style of learning.” (<i>Reactance</i>)
“I prefer to maintain the current baseline and try not to make a change in learning even when better alternatives are available.” (<i>Status quo bias</i>)
Biases in probability and belief
“I tend to expect more extreme outcomes than those outcomes that actually happen.” (<i>Exaggerated expectation</i>)
“I tend to believe that I am less at risk of experiencing a negative outcome and estimate its chances lower than it might actually happen.” (<i>Optimism bias</i>)
Attributional biases
“I often overestimate my ability in learning.” (<i>Dunning-Kruger effect</i>)
“I feel irresponsible for undesirable outcomes.” (<i>Self-serving bias</i>)
Memory errors
“I attribute positive outcomes to options I chose.” (<i>Choice supportive bias</i>)
“I tend to continue to pursue learning methods initially taken even when they later proved to be false or obsolete.” (<i>Continued influence</i>)
<i>Note:</i> The actual questionnaire was rearranged in random order without subscales or cognitive bias types in parentheses.

3. Results

Multiple linear regression was used to identify cognitive bias factors from 11 predictor variables which significantly affected participants' own scores in TOEFL iBT® (dependent variable). When processing data, the author used the statistical software BellCurve for Excel. Using the Stepwise method, model that includes the variables that are important in the prediction and excludes the ones that have only a trivial effect was found (See Table 4 for a summary of the results).

Table 4 Descriptive Statistics of Multiple Regression

<i>r</i>	<i>r</i> ²	<i>r</i> ² Adjusted		<i>n</i>		
.66	.58	.44		33		
<i>ANOVA</i>						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig. (p)</i> ^a	
Regression	5	3387.7	677.5	4.2	.006**	
<i>Residual</i>	27	4367.9	161.8			
Total	32					
<i>Coefficients</i>						
Variables	β	<i>SE</i>	<i>t</i>	<i>p</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
<i>Reactance</i>	-8.2	2.7	-3	.006**	-13.8	-2.6
<i>Outcome bias</i>	7.8	2.3	3.3	.003**	3	12.6
<i>Choice-supportive bias</i>	6.1	2.5	2.4	.02*	0.9	11.2
<i>Optimism bias</i>	3.3	2	1.6	.11	-0.8	7.3
<i>Exaggerated expectation</i>	3.5	2.1	1.6	.12	-0.9	7.8
Constant	31.9	14.1	2.3	.03*	3.1	60.8

Note : ^a Dependent Variable: Total Score, *: $p < .05$, **: $p < .01$,

The findings obtained for the correlation between 11 cognitive biases and participants' test scores were satisfactory (See Table 3). The overall regression was statistically significant, $F(5, 27) = 4.2$, $r^2 = .58$, $p = .006$. It was found out that, out of all examined variables, three variables were found to be significant; Variable *Choice-supportive bias* ($p = .02$) was fairly significant, and variables *Reactance* ($p = .006$) and *Outcome bias* ($p = .003$) were highly significant which most likely contribute to the overall variability of academic success, whereas two remaining predictor variables: *Optimism bias* ($p = .11$), *Exaggerated expectation* ($p = .12$) did not significantly predict high score. Namely, two variables *Outcome bias* ($\beta = 7.8$, $t = 3.3$) and *Choice-supportive bias* ($\beta = 6.1$, $t = 2.4$) had positive correlations with learners' test scores, on the other hand, one variable, *Reactance bias* ($\beta = -8.2$, $t = -3$) had a significantly negative influence on their scores.

4. Discussion

4.1 Choice-supportive bias

The results revealed that certain *cognitive biases* could work positively and negatively. I should then like to move on to discuss the ambivalent results of significant variables and interpret their positivity and negativity. The question "*I attribute positive outcomes to options I chose.*" was answered before they knew the test result. They did not make any attributions yet to their TOEFL iBT® scores at the time. Accordingly, each participant's self-analysis at the time could be construed as their innate or general tendency. *Choice-supportive bias* had a rather positive influence on participants' test results ($p = .02$). Contrary to the author's prediction, the result showed that the more they attribute positive outcome to options they chose, the higher scores they obtained.

Concerning this positivity of the bias shown, the author speculates that this bias positivity can be construed in accordance with the *positive illusion theory* as possible explanations. Greenwald (1980) proposes that people also hold positive illusions because such beliefs often enhance their productivity and persistence with tasks on which they might otherwise give up. Boiney et al. (1997) also propose that “motivated decision makers bias their judgments more or less as needed to support the desired conclusion and motivated decision makers exhibit confidence bolstering and thereby remain at least as confident as non-motivated decision makers in their biased estimates” (1997, p.1). Regarding this positivity of cognitive biases, Cummins & Nistico (2002) claim that “well-being homeostasis is controlled by positive cognitive biases pertaining to the self. Most particular in this regard are the positive biases in relation to self-esteem, control and optimism” (2002, p.37). Concerning positivity of *choice-supportive bias* shown in the current research, it is possible that memories of chosen alternatives affected participant learners’ sense of well-being. Positive illusions are a form of self-deception or self-enhancement that feel good, maintain self-esteem, or avoid discomfort, at least in the short term. Positive illusions have been commonly understood as one of the apparent effects of self-enhancement, a desire to maximize the positivity of one’s self-views and “self-enhancing biases often make people feel good about themselves and have other short-term benefits” (Leary, 2007, p.324). In a positive light, *positive illusions* can be important contributors to one’s positive feelings and can make a good outcome in a short-term learning. Accordingly, in the case of participant learners who worked on the test relatively in a short-term, positivity of *choice-supportive bias* shown in relation to their academic performances can be attributed to short-term effects of *positive illusion theory* in terms of self-esteem, optimism and self-enhancement as suggested in the previous literature.

4.2 Outcome bias

Outcome bias also significantly had a positive influence on test results ($p = .003$). The question “I place much importance on the final outcome rather than an assessment of the time and quality of previous learning.” was answered before conducting lessons. They did not make any attributions yet to their TOEFL iBT® in the questionnaire. The means that each participant’s self-analysis scales concerning this bias question are also rather their innate or general trait. The result found that the more participants put importance on result, the higher their test results got. They put more stress on test results and processes were less significantly considered in learning. As described in Table 2, *Outcome Bias* is the tendency to evaluate decisions solely based on the outcomes. A decision is based on the outcome of previous events, without regard to how the past events developed. and “people take outcomes into account in a way that is irrelevant to the true quality” (Baron & Hershey, 1988, p.570). However, the *outcome bias* trait, which is thus commonly categorized as a negative trait, worked positively in this empirical study. Considering the fact that participants were returnee learners who were applying for universities with TOEFL scores, there is no doubt that they were desperately in need of good test results. This might explain why they valued results more than learning processes and more goal-oriented rather than process-oriented. Hence, it can be surmised that in the case of a relatively short-term learning, it is possible that *outcome bias* mindset worked

positively as *choice-supportive bias* did.

4.3 Reactance Bias

The result of multiple regression test showed that *reactance bias* was the most influential variable negatively influencing participants' TOEFL iBT® scores. Degrees of *reactance bias* among participant learners were measured based on their answer scales to the question: "*When negative feedbacks are given or learning methods are forcefully regulated by the teacher, I tend to react against suggestions given even if they seem to be good ones and try to maintain my own style of learning.*" The result indicated that the more negative feedbacks they receive and forcefully regulated, the more reactant and persistent they become in learning. In addition to this, the more reactant they became, the lower their scores became. This means that negativity of feedbacks and forcefulness on learning styles obviously had adverse effects on their academic performances.

Reactance is an unpleasant motivational arousal that emerges when people experience a threat to or loss of their free behaviors (Brehm, 1989). The concept of psychological *reactance* was originally formulated by psychologist Jack Brehm. He explains that *reactance* occurs when "people are motivated to restore specific behavioral freedoms that are threatened or taken away from them" and "people become motivationally aroused by a threat to or elimination of a behavioral freedom (1989, p.72). In short, reactance can be defined as the motivation to regain a freedom after it has been lost or threatened. It causes individuals to rebel against the pressure they are placed under. Persuasion, enforcement, prohibition and instruction all can examples of threats to the freedom to act as desired, and this is where reactance comes into action. In terms of learner psychology, *reactance* is a response of noncompliance and serves as a motivator to restore one's freedom. Students do not want to be told that they have been studying in the wrong way. In such cases, giving negative feedbacks on their competence in learning and regulating their learning styles in a forceful or compulsive manner, regardless of its accuracy, can be risky in the sense that getting straight to the point might incur disagreements and conflicting situations might lead to some adverse outcomes for both sides.

4.4 Prescriptive Debiasing

Taking potential risks into consideration, teachers must find ways to reduce this *reactance* trait with effective debiasing techniques because it is difficult for individuals to recognize and correct biases (Kahneman, 2003). *Debiasing* is the art of reducing biases in human thinking, by finding a variety of useful bias-reducing techniques and most importantly, "*debiasing requires intervention*" (Larrick, 2004, p.318). In education, however, interventions must be interpreted positively by the learning side. Overall findings of the previous research show that cognitive *debiasing* works in some cases and can be helpful when it comes to a large range of *cognitive biases* (Lilienfeld et al., 2009). The use of appropriate training, interventions, and *debiasing* techniques can reduce some cognitive biases, to some degree, in some situations. However, in order to reduce *cognitive biases* debias successfully in the individual, we should engage in a proper *debiasing* process because *debiasing* is not always an easy process and finding the appropriate *debiasing* approach to use

in a certain situation can be a difficult process because a *debiasing* approach that works well in one situation might fail in another (Sherbino et al., 2014). In the school setting, it is particularly important for the teaching side to be able to engage in proper *debiasing*. We should keep it in mind that the effectiveness of debiasing varies based on a large range of factors including the person that we are trying to debias and the specific bias that we are trying to reduce. There are three approaches considered to be effective to *debiasing* cognitive errors: to develop awareness of the bias, to challenge old beliefs using different perspectives and to elicit external feedback (Soll et al., 2015). Each approach has strengths and weaknesses and there is a limitation in using domain-general approaches as general-purpose prescription. In addition to general *debiasing* approach, there are also some more specialized *debiasing* techniques that are meant to be used on a narrower range of biases. Such techniques can sometimes be more effective than generalized *debiasing* strategies. Once specific bias trait is identified, domain-specific treatments or prescription will be more effective. In light of this, I should like to explore possibilities of prescriptive methods, to mitigate *reactance* by learners referring to two *debiasing* theories: namely, *nudge*, and *reverse psychology*.

A “*nudge*” is an intervention in the decisional context that steers people’s decisions, actions, and behaviors by acting on their cognitive biases. Overall, *nudges* can selectively work for some people, in some domains, some time (Thaler & Sunstein, 2009). The *nudge* theory is the idea of altering people’s behavior in a predictable way without forbidding any options. Instead of choosing an option, learners can be assigned by instructors. Providing learners with assigned options can be beneficial for some reasons. First, since *nudges* are not mandatory, students should feel that the nudge respects their ability to choose. Specifically, we should make sure that the people who are affected by the *nudge* feel that it doesn’t eliminate their autonomy and right to choose freely. When learners feel like they have a choice it can increase their sense of freedom and reduce *reactance*. Second, making a choice or having a choice made for you by other people in your best interest can prompt memory attributions that support that choice (Mather et al., 2003). Third, providing learners with outcomes and details of what will happen if they follow the assigned option will create a sense of comfort and give learners a sense of control over the situation.

What is more, *Reactance* can occur when an individual senses that someone is trying to compel them to do something and often, the individual will offer resistance and attempt to extricate themselves from the situation. It is a personality characteristic and some individuals are naturally high in *reactance*. In such cases, *reverse psychology* is also a technique involving the assertion of a belief or behavior that is opposite to the one desired, with the expectation that this approach will encourage the subject of the persuasion to do what is actually desired. The one being manipulated is usually unaware of what is really going on. *Reverse psychology* relies on the psychological phenomenon of *reactance*, in which a person has a negative emotional reaction to being persuaded, and thus chooses the option which is being advocated against (MacDonald et al., 2011). In teaching, *Reverse psychology* can be implemented from two perspectives. On the one hand, it can be used as a manipulative persuasion tactic in a negative manner. Alternatively, it can also be used as a helpful method to benefit relationships.

4.5 Educational Implications

The findings obtained in the current study have some educational implications. Regarding the positive use of cognitive bias, for the purpose of enhancing learners' motivation, confidence, self-esteem, *choice-supportive bias* can be positively exploited to affect learner's decisions and can be used to the teacher's advantage. There might be some cases where someone needs to tell learners that they are not being objective and their tendency to cling to his or her decision too long is damaging the progress. However, when learners stick to a strategy of their choice, it is possible that they have tendencies to tie their self-esteem to their decision-making. The result indicates that participant learners tend to justify their decisions and choices as better over others and still show better results. Hence, rather than explaining the importance and benefits of the process, teachers could intentionally focus on the outcome and how this will affect them. In terms of bias utilities, in a specific case or depending on who we are trying to influence, *outcome bias* can also be used to great effect. In some cases, "optimism can lead people to experience their situation more positively, and overconfidence may help them achieve even unrealistic goals" (Dunning, 2011, p.p.288-9). The research by Robins & Beer (2001) provided evidence that people who have positive illusions may have both short-term benefits and long-term costs. In the current research, since participant learners had to achieve academic success in TOEFL iBT® in a relatively short-term, it is possible that positive illusions or optimism had short-term benefits. Overall, as an educational significance, by understanding the cognitive biases learners have, the teacher could simply justify learners' optimism and choice for them in order to enhance their motivation and self-esteem, and increase the chances of influencing them for the better.

Regarding the negativity of *reactance bias* found and possible debiasing techniques, based on a clear understanding of a learner's current beliefs, and context or domain to be impacted, personalized *nudges* would lead learners to successful behavior change and also to optimal success. For the purpose of mitigating resistance from learners who are high in *reactance* without risks, employing *nudges* would be an effective debiasing technique so that interventions can be interpreted positively. Utilizing *nudges* would also become an opportunity for educators to truly analyze the problem and define what it might take to successfully change individual behavior. Besides, teachers could also employ *reverse psychology* in a bid to exploit *reactance* for their benefit, in an attempt to influence learners to choose the opposite of what is being requested. In order to prevent *reactance* from occurring, employing and applying *reverse psychology* theory in teaching and guidance could be an effective tool in debiasing *reactance* traits, especially for those teachers dealing with returnee learners in adolescence assumingly high in *reactance* who have negative emotional reactions to their advice and tend to persist in their own way of learning. This psychological approach has proven to be particularly effective with adolescents as many of these are prone to rebellious tendencies (MacDonald et al., 2011). Overall, psychological *reactance* occurs as a response to a perceived restriction on our personal freedom and being told not to do something can cause learners to rebel against the situation. The empirical research by Sherbino et al. (2014) provides the evidence that the educational interventions employing cognitive forcing

strategies failed to show any reduction in diagnostic errors and proved to be ineffective in some cases. Therefore, it is necessary for instructors to engage in proper *debiasing* depending on who we are going to debias and be aware of pros and cons of giving succinct feedbacks taking their psychology into consideration and try to curb risks of their emotional rejections (Cohen et al., 2000). In summary, the teaching side should pay more careful attention when dealing with those learners high in *reactance*. Cognitive biases can be directed in a way that improves efficiency and effects in leaning as long as teachers ensure that students do not feel controlled, but instead feel empowered to achieve more by accommodating learner autonomy and using healthy constraints.

5. Conclusion

Using the psychological approach, the author investigated eleven *cognitive bias* traits assumingly characteristic of returnee learners and their effects on academic performances. The result found out that *cognitive biases* could work both positively and negatively and that certain *cognitive biases* and academic success are compatible. On the positive side, it is possible that exploiting and utilizing some *cognitive biases* can positively influence learners in terms of motivation, confidence and self-esteem. On the negative side, certain *cognitive biases* could adversely influence academic performance. In such cases, mitigation of detrimental bias traits or *debiasing* guidance would be effective in teaching. However, when *debiasing*, the teaching side should consider each learner's personal trait and context to maximize its effects without impairing their motivation, confidence and self-esteem. In conclusion, to induce awareness about the need to change and to elicit motivation to change, an ideal approach we should take would be guiding learners with affirmation and encouragement or guiding implicitly and shifting learners for the better.

I hope that this research work provides a helpful framework for those doing coaching and training learners in adolescence, particularly returnee learners. Furthermore, I would be glad if this is of any help to learners in developing awareness of their own biases in their thinking and in turn help guide their future thinking and behaviors.

6. Limitations

In this study, significant cognitive bias factors were tested with eleven biases and effective *debiasing* techniques were discussed, but further researches of effective *debiasing* techniques are needed. There are more cognitive biases types to be considered and more significant cognitive bias traits might be found concerning learner psychology.

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