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Investigating the Effects of Attributional Retraining Procedures on High School Students' Foreign Language Causal Attributions and their Foreign Language Achievement

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ABSTRACT

This study investigated the effects of attributional retraining techniques on high school students' foreign language causal attributions and foreign language achievement. To determine the participants' initial causal attributions, the Revised Causal Dimension Scale (CDS-II) (McAuley et al. 1992) was distributed among 327 Iranian high school students shortly after they had taken their first English achievement test. Participants were required to rate their perceived success or failure by reflecting on their performance on the test based on the dimensions of the CDS-II. Subsequently, participants in the experimental group received attributional treatments in videotape format followed by group discussions. At the end of the semester, the participants in both groups took a final English language achievement test and the CDS-II again. The findings showed that attribution retraining techniques are effective in changing the participants' causal attributions in the predicted direction and improving their performance on foreign language achievement tests.

One of the conceptually related theories of motivation is Attribution Theory which describes how people's 'explanations, justifications, and excuses about their own success and failure influence their motivation' (Woodfolk, Winne, & Perry, 2003, p. 358). Weiner, an American social psychologist who has mostly researched Attribution Theory, describes the theory as dealing with how individuals interpret events, how they attribute success or failure to various causes, and how they attribute causes to behavior (Weiner, 1985; 1994; 2000; 2006; 2010). He identified a number of common causes (called causal ascriptions) used by individuals to account for their success or failure. These causal ascriptions can be categorized into three dimensions (a 2 × 2 × 2 taxonomy): locus of causality (internal or external), stability (stable or variable over time), and controllability (controllable or uncontrollable). The taxonomy leads to eight possible cells

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within which any specific attribution can be categorized (Haynes, Perry, Stupnisky, & Daniels, 2009) (See Table 1). Locus of causality deals with whether the causes are within and thus internal to the actor or considered as located in the environment and thus external to the actor (Weiner, 2010). Attributing success to internal factors such as aptitude and effort will lead to a remarkable improvement in motivation, high self-esteem, and a feeling of pride (Ames, 1992). On the other hand, attributing failure to external factors such as task characteristics and luck, used as a self-protective strategy, protects an individual's self-esteem (Haynes et al., 2009). The second category, stability, is about whether the causes of events are stable over time or can change in the future. For example, an individual who considers causes as stable (e.g., seeing the task as too difficult or ability as stable and uncontrollable) is expected to fail in the future, while one who attributes failure to unstable causes such as lack of effort or bad luck is expected to improve in future performances (Woodfolk et al., 2003). The third category, controllability, accounts for individuals' ability to control the causes and feel responsible for their failures or success. For instance, those feeling in control of and responsible for their actions and behaviors will not be discouraged when experiencing failure and will do their best to improve in future, while those seeing the causes as uncontrollable may feel discouraged and are expected to experience more failures in the future (Woodfolk et al., 2003). In addition, Weiner linked attribution theory to academic achievement and introduced ability, ease or difficulty of the test, effort, mood, and fate (luck) as significant factors influencing attributions. However, it should be noted that the taxonomy is heuristic and that the dimensions of locus, stability, and controllability are, in fact, continuous, not dichotomous (Weiner, 1985). Table 1 illustrates hypothetical attributions for poor academic performance.

Table 1.
Weiner's (1985) Causal Dimensions: Hypothetical Attributions for Poor Academic Performance

	Locus of Causality			
	Internal		External	
	Stable	Unstable	Stable	Unstable
Controllable	Never studies	Insufficient effort	Instructor is biased	No help
Uncontrollable	Low ability	Sick the day of test	Test difficulty	Fate

As mentioned above, Table 1 shows hypothetical attributions for poor academic performance. The attributions "Sick the day of test", "No help", and "Fate" are also generally referred to as mood, assistance, and luck, respectively. Furthermore, the attributions "Never studies" and "Instructor is biased" are generally referred to as motivation and teacher characteristics, respectively. Although these two factors are not always stable and may change over time, they can be measured as stable factors at any specific time when, for instance, a student's attributions for poor academic performance are being investigated. As Weiner (1985) argues, the dimensions of locus, stability, and controllability are, in fact, continuous, not dichotomous.

According to Weiner (2010), causal beliefs have affective implications (or emotional consequences). He maintains that attributing success to internal factors (self) brings about a heightened feeling of pride in accomplishments and a boost in self-esteem. As a result, ascriptions of success to ability or effort gives rise to pride and invokes positive views of the self. On the other hand, Weiner argues that 'ascription of failure to a controllable cause such as lack of effort, given a desire to reach the goal, elicits guilt and regret' (p. 561). At the same time, however, it can motivate the individual to try harder in future tasks.

This theory has a number of implications for the classroom regarding student motivation and achievement (Morris, 2013; Peggy Hsieh & Schallert, 2008; Ruthig, Perry, Hall & Hladkij, 2004). As Weiner (2010) puts it, success or failure in achievement-related contexts can be explained by individuals' causal attributions. The results of several attribution-related studies (e.g., Boruchovitch, 2004; Hall, Hladkyj,

Perry & Ruthig, 2004; Haynes, Perry, Stupnisky, & Daniels, 2009; Newman & Stevenson, 1990; Tobin, 2012; Weiner, 2000, 2006, 2010) suggest that students' causal attributions might have a considerable impact on their motivation and academic achievement. Dörnyei (2005) also sees the theory as unique because it effectively connects people's past experiences with their future achievement efforts.

However, as the literature suggests, causal attributions seem to be unstable and changeable which is very promising for education. Several attribution-focused studies (e.g., Haynes at al., 2009; Morris, 2013; Perry, Hechter, Menec, & Weinberg, 1993; Struthers & Perry, 1996; Weiner, 2006) have confirmed the variable nature of causal attributions and have suggested that Attributional Retraining (AR) programs have the potential to replace frustrating attributions with inspiring ones. Weiner (2006), for instance, argues that personal attributions for success or failure can be changed to have a remarkable positive influence on future performance. He believes that, for example, 'altering attributions for failure from low aptitude to lack of effort enhances expectancy of success, reduces shame, and fosters motivation' (p. 165). Furthermore, AR procedures enable school psychologists and teachers to investigate into students' causal attributions and devise procedures to replace their maladaptive, discouraging attributions for failure outcomes with more adaptive and inspiring ones (Haynes et al., 2009; Morris, 2013; Ruthig et al., 2004).

Due to their potential benefits, attribution-based treatments have been employed in several academic settings. Haynes et al. (2009) see AR as one of the solutions to the deleterious effects of maladaptive failure attributions on motivation, performance, and achievement. They argue that education-based treatments vary in terms of the purpose of the intervention and believe such treatments may have three common purposes: knowledge transmission, skill development, and motivation enhancement. AR procedures are, in fact, classified under the category of 'motivation enhancement', the purpose of which is to modify students' causal attributions and improve their motivation and achievement (Haynes et al., 2009).

2. Theoretical Framework

As mentioned earlier, attribution-based treatments have been employed in several academic settings with the aim of replacing students' maladaptive attributions with more encouraging ones and consequently increasing their motivation and learning. In this regard, Hall et al. (2004) examined the effects of AR techniques on academic motivation and achievement of college students who were using elaborative learning strategies and concluded that AR techniques had the potential to bring about significant improvement in performance, motivation, and positive affect. Peggy Hsieh and Schallert (2008) also investigated the relationship between and among self-efficacy, attributions, and academic achievement in 500 American undergraduates studying Spanish, German, and French as foreign languages at a state university. They concluded that students who believed their successful performance was due to their high ability would be more likely to be higher achievers in the future because such beliefs might lead to feelings of pride, higher expectations for success, and more persistence. In a more recent study, Morris (2013) investigated the effectiveness of an AR program for academic performance of some college students who had enrolled in a psychology course and participated in a three-week-long AR workshop, three times a week. The workshops, where participants received AR treatments in the form of videotapes followed by remedial practice exercises, were designed to help students complete their assessments and prepare for their examinations. In the pre-AR stage, she observed that the group of students who had attended the workshops did not differ from those in the control group who had not attended the workshops. However, in the post-AR phase, she noticed that those who had attended the workshops achieved higher grades in the two long-term overall performance measures (i.e. their grade on psychology final exam and their grade point average) and outperformed those who had not attended the workshops.

The role of motivation-enhancing attributions has been researched and emphasized in second language learning as well (e.g., Bell & McCallum, 2012; Cochran et al., 2010; Dörnyei, 2005; Kang, 2000; Ushioda, 2001). As argued by Fisher (2001) and Graham (2002), many students believe learning a foreign language (FL) is a demanding task and only people with a special gift can excel in it. Ushioda (2001) also asserted that due to the high frequency of language learning failure across the world, attributional procedures might play a crucial motivational role in language studies. In this regard, Bell and McCallum (2010) investigated the relationships between FL achievement and FL attributions, anxiety, attitudes, and aptitude for American college students. They found that luck attributions for success were negatively correlated with FL achievement, while effort attributions were positively correlated with anxiety, suggesting that anxious students considered ability and effort as main factors contributing to successful performance on FL achievement tests. Using a validated researcher-developed questionnaire, Lei and Qin (2009) investigated the success and failure attributions of Chinese tertiary-level FL learners and found that they attributed their success to such factors as effort, teacher, confidence, and practical use. FL failure, on the other hand, was attributed to such factors as lack of confidence, lack of effort, test-oriented learning, lack of practical use and lack of external help. Reviewing previous research on attributions in FL studies, Lei and Qin (2009) argued that FL attributions seem to differ from those in other academic subjects because FL learners perceive such external factors as teachers, the family, and the classroom environment as contributing more to their success or failure in their FL performance. They attributed this tendency partly to the fact that FL learning is more practice- and communication-oriented with teachers and peer learners than learning other academic subjects as mathematics and chemistry. In a more recent study, Dong, Stupnisky, and Berry (2013) investigated the multiple causal attributions of 156 North American college students in FL classes and allowed the participants to mention as many as three different causal ascriptions for both their success and failure in learning the FL. In other words, they allowed their students to simultaneously make multiple attributions, which, they believe, 'may be a better reflection of students' true thinking and the related consequences' (p. 1590). The results of their study indicated that students made a range of multiple explanations for their performance and that the pattern of causal attributions differed between success and failure causes. They also found that the top-rated cause for both success and failure causes was effort which, according to Weiner (1985), has a significant role in students' academic performance because it is a personal controllable and changeable attribution. Finally, they argued that 'students who make several adaptive attributions may believe they will be more successful and challenge the stereotype that learning a foreign language is difficult' (p. 1588).

As one of the few studies conducted in Iranian context, Pishghadam and Zabihi (2011), employing McAuley et al.'s (1992) Causal Dimension Scale II (CDS-II) and Peggy Hsieh's (2004) Language Achievement Attribution Scale (LAAS), compared six causal ascriptions (ability, effort, task difficulty, mood, luck, and teacher) and four attributional properties (locus of causality, stability, personal control, and external control) with Iranian learners' English language achievement. They found significant correlations between learners' causal attributions and their language achievement. They also found that learners who attributed their academic success or failure to effort achieved higher grades on language achievement tests. Furthermore, they reported that stable and personal attributions were highly correlated with FL achievement. Utilizing CDS-II and LAAS, Hashemi and Zabihi (2011) also investigated the role of language learners' attributions for success and failure in learning English as a foreign language and their performance on placement tests and found significant correlations. Likewise, they found that an effort attribution was the best predictor of high grades on English language proficiency tests. Besides, they found that internal locus positively predicted the learners' high English language proficiency scores.

2.1. Purpose of the Study and Research Questions

The review of the literature on the topic under question indicates that the majority of attribution-related studies in education have targeted adult college or university students in Western education contexts (e.g., Morris, 2013; Ruthig et al., 2004). Even though there are numerous studies looking at this, there seems to be a gap in the literature regarding Asian high school students' causal attributions, particularly in relation to students in the context of the present study (i.e. Iran), and the possible impact of causal attributions on their FL causal attributions and their FL achievement (as also emphasized by Bell & McCallum, 2012). Moreover, as Cochran, McCallum, and Bell (2010) argued, FL achievement could not be predicted by general attributions for academic success. Accordingly, they suggested that FL attributions be investigated independently. This study is significant in that it is, to the best of our knowledge, the first study to investigate the effects of AR techniques on Iranian high school students' FL causal attributions and their FL achievement. To this end, the following research questions were formulated:

(1) To what do Iranian high school students attribute their success and failure regarding their performance on FL achievement tests before and after receiving attributional retraining?

(2) Are attributional retraining procedures in videotape format followed by consolidation exercises able to influence Iranian high school students' FL causal attributions in a positive direction?

(3) Are attributional retraining procedures in videotape format followed by consolidation exercises able to improve Iranian high school students' performance on FL achievement tests?

3. Methodology

3.1. Participants

This study involved two phases of data collection and analysis (i.e. the pilot and the main study). 182 students (89 males and 93 females) ranging from 16 to 18 years of age were selected from three randomly-chosen high schools and six randomly-chosen classrooms (2 classes per school) to participate in the pilot study to ensure the validity and reliability of the instrument (i.e. CDS-II) when used in the context of the present study. The participants of the main study constituted 12 classrooms randomly selected from six public high schools (2 classrooms per school). The schools were located in Kermanshah (a city in the west of Iran) and the towns nearby. Six of the classrooms with 172 students (88 males and 84 females) served as the experimental group (EG) or attributional retraining group and the remaining six classrooms with 155 students (80 males and 75 females) were used as the control group (CG). The participants (a total of 327 male and female students) were between 16 and 18 years of age and received mainstream education from high schools affiliated with Iranian Ministry of Education. English as a foreign language (EFL) was taught at all the schools as a school subject. The students attended their English class about three hours a week. Class size varied from 23 to 31, with an average of 26 students. Moreover, it should be noted that six English teachers who taught the participants English at those high schools also assisted us in collecting the attribution data and giving the mid-term and final exams. Furthermore, six school counselors working in those high schools helped us plan the AR program, conduct the AR intervention, and give the AR treatments and placebos.

3.2. Instruments: Validation and Reliability Analysis

The original Causal Dimension Scale (CDS) was developed, validated, and tested for reliability by Russell (1982) to assess how people perceive the causes they have stated for an event in terms of the three dimensions of attribution described by Weiner. However, several studies later (e.g., McAuley & Gross,

1983; McAuley et al., 1992) showed the controllability scale was not as valid as it was claimed by Russell (1982). Accordingly, McAuley et al. (1992) introduced the Revised Causal Dimension Scale (CDS-II) by changing the items in the controllability scale and asserted that it assesses causal attributions along four dimensions of Locus of Causality, Stability, Personal Control, and External Control (See Appendix A). They reported the reliability coefficients for the four subscales based on the results from four separate studies (r = .60-.91).

However, to be appropriately used for the context of this study, the CDS-II was translated and back-translated by the authors, and the translation was edited and confirmed by two Iranian university professor psychologists. To ensure the validity and reliability of the Persian translation of the CDS-II, it was piloted with 182 high school students described earlier. Then Cronbach's alpha reliability analysis was conducted to estimate the internal consistency of separate items of the scale and, an exploratory factor analysis was run on the data to ensure its construct validity (See Table 2).

Table 2.
Reliability Coefficients and Factor Loadings from Exploratory Factor Analysis for the Four Dimensions of the CDS-II

Dimensions	**Items**	**Factor loadings**	**Cronbach's α**
Locus of Causality	1	.78	.71
	6	.87	.69
	9	.91	.76
Stability	3	.69	.68
	7	.83	.75
	11	.78	.74
Personal Control	2	.68	.84
	4	.73	.89
	10	.75	.73
External Control	5	.66	.75
	8	.61	.86
	12	.58	.92

As indicated in Table 2, the questionnaire enjoyed an acceptable level of internal consistency (ranging from .68 to .92). The reliability of the questionnaire at the scale level was found to be .84, indicating a good level of internal consistency. Besides, the exploratory factor analysis conducted on the data obtained through the CDS-II indicated that the scale was structured by four factors that could be interpreted as Locus of Causality, Stability, Personal Control, and External Control. Also, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy showed an acceptable value of 0.68 and Bartlett's test of sphericity indicated a significant value (P<.001). Therefore, the results of the factor analysis confirmed the construct validity of the scale when used in Iranian high school context.

Moreover, participants in both groups were given a mid-term exam by their course instructor based on the content of their English course and a final exam at the end of the semester. Both grades were obtained from their course instructors to make a comparison between participants' performance before and after the intervention.

3.3. Data Collection Procedures

The AR treatment procedure employed in this study was based on the AR model proposed by Haynes et al. (2009) consisting of five components that were administered sequentially over an entire academic semester: a) Pre-AR Diagnostic Assessment (e.g., self-report questionnaire), b) Causal Search Activation (e.g., first course exam), c) AR Induction (e.g., AR videotape or handout), d) AR Consolidation (e.g., discussion, writing exercise, or an aptitude test), and e) Post-AR Assessment (e.g., self-report questionnaire, actual course grades, and grade point average). Each phase is separately explained in detail below:

3.3.1. Pre-AR Diagnostic Assessment and Causal Search Activation

Approximately two months after the beginning of the semester, participants in both groups (i.e. EG and CG) were given a mid-term exam based on the content of their English course by their course instructors. Immediately after the results were announced to them, the validated Persian translation of the CDS-II was administered to participants in both groups, and they were required to report the causes for their performance (success or failure) on the exam. Then they were requested to rate their perceived success or failure by reflecting on their performance on the exam based on the four dimensions of the CDS-II (Locus of Causality, Stability, Personal Control, and External Control).

3.3.2. AR Treatments

The purpose of this stage, which is technically called AR induction stage, is to instill desirable attributions believed to be conducive to future success (Haynes et al., 2009). The content of the AR treatments, based on Weiner's (1985) taxonomy of causal dimensions, intended to emphasize internal, controllable causes and de-emphasize external, uncontrollable ones. In doing so, this study drew upon AR videotape method developed by Struthers and Perry (1996) in which the concept of causal attribution is introduced to participants in the EGs. For instance, in one of the videotapes (Available at https://www.youtube.com/watch?v=54Wm1L0kwJk), developed by Struthers and Perry (1996), a psychology professor asserts that students who feel they are in control of their grades at school, actually outperform those who believe they have little control. Then two undergraduate students discuss how causal attributions might influence academic performance. At the end, the psychology professor summarizes the main points discussed by those two college students and emphasizes the importance of attributing academic outcomes to controllable causes (See also Haynes et al., 2009; Haynes Stewart, Clifton, Daniels, Perry, Chipperfield, & Ruthig, 2011; Ruthig et al., 2004; Struthers & Perry, 1996).

Similarly, in this study, participants in the EG received AR treatments in videotape format (developed by Struthers & Perry, 1996). The videotapes lasted 10-20 minutes each and were shown weekly to students by the school counselor for six consecutive weeks. The content of the AR videos was in English, which was not the participants' native language. However, the original videos (i.e. in English) were decided to be employed in this study mainly due to their dependability and having been used in various contexts (in previous research studies) successfully. Considering these limitations, we, as language teaching experts, made sure that the language (i.e. content and structure) used in the videos was not complex and thus understandable to the participants. However, to make certain that the content of the videos was fully comprehended by all the participants, they were played twice: once without giving any translations and once with Persian translation in order to give all the participants equal chance to benefit from the videos. On the other hand, participants in the CG watched a number of videos containing no attributional information but information about the importance of learning foreign languages in general

and knowing English as an international language in particular (e.g., https://www.youtube.com/watch?v=u0cUNFPN4YU).

3.3.3. AR Consolidation

Immediately after watching the videotapes, students in the experimental groups were assigned to small groups of 3 to 5 and were required to discuss the main points raised in the videotapes and describe how those points applied personally to their own previous performances on FL achievement tests. The groups were instructed by the school counselor to recall a recent instance when they performed poorly or did not perform as they expected on an English exam at school and think of reasons (based on the three causal attributions) for their poor performance. Then they were required to discuss the reasons with other members and identify the controllable and uncontrollable causes and how they could replace their maladaptive attributions with adaptive ones (See also Perry & Struthers, 1994). Subsequently, the spokesperson of each group reported their findings to the school counselor who compiled a list, typed them into a computer, and displayed them on an overhead or data projector. Finally, the list of findings was discussed with the whole class regarding desirable and undesirable attributions (See also Struthers & Perry, 1996). The members of the CG also discussed the content of the videos they had already watched about the importance of learning foreign languages and the best methods of learning English as an international language.

3.3.4. Post-AR Assessment

Two weeks after the intervention, participants in both groups took their final exam (in late January) as a requirement for fulfillment of their FL course at school. At this stage, to reassess their attributions for the purpose of pre- to post-AR comparisons, the validated Persian translation of CDS-II was filled out by the participants in both groups after the results had been announced to them. Once again, to make pre- to post-AR comparisons, they were required to report the causes for their performance (success or failure) on their final exam and rate their perceived success or failure by reflecting on their performance on their final exam based on the four dimensions of the CDS-II. Finally, their grades on the mid-term exam were compared with those of their final exam to see if the AR procedures employed in this study had been able to improve their performance on their FL course achievement tests.

4. Results

To answer the first question of the study (i.e. To what do Iranian high school students attribute their success and failure regarding their performance on FL achievement tests before and after receiving attributional retraining?), we analyzed the frequency of the causal ascriptions made by participants in both groups before and after the intervention. Table 3 summarizes the participants' responses to the multiple-choice question (See Appendix A) included in the CDS-II which was associated with their causal ascriptions for their performances on the FL achievement tests before and after the intervention.

Table 3.
Frequency of Success and Failure Causal Attributions for Performances on the Pre- and Post-AR Achievement Tests

	EG (N=172)				**CG** (N=155)			
	Pre-AR phase		Post-AR Phase		Pre-AR phase		Post-AR Phase	
	Success	Failure	Success	Failure	Success	Failure	Success	Failure
Perceived Causes	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Aptitude	21 (29.6)	5 (4.9)	33 (23.9)	0 (0.0)	19 (30.6)	6 (6.4)	21 (25.9)	6 (8.1)
Luck	4 (5.6)	9 (8.9)	1 (0.7)	0 (0.0)	1 (1.6)	9 (9.6)	1 (1.2)	5 (6.7)
Mood	3 (4.2)	19 (18.8)	6 (4.3)	12 (35.2)	2 (3.2)	13 (13.9)	5 (6.1)	11 (14.8)
Effort	37 (52.2)	13 (12.8)	92 (66.6)	14 (41.1)	26 (41.9)	12 (12.9)	33 (40.7)	8 (10.8)
Teacher characteristics	2 (2.8)	14 (13.8)	1 (0.7)	1 (2.9)	2 (3.2)	11 (11.8)	4 (4.9)	7 (9.4)
Assistance	1 (1.4)	10 (9.9)	1 (0.7)	0 (0.0)	3 (4.8)	10 (10.7)	1 (1.2)	0 (0.0)
Motivation	1 (1.4)	6 (5.9)	2 (1.45)	3 (8.82)	4 (6.45)	10 (10.7)	2 (2.4)	5 (6.7)
Task characteristics	2 (2.8)	25 (24.7)	2 (1.4)	4 (11.7)	5 (8.0)	22 (23.6)	14 (17.2)	32 (43.2)
total	71 (100)	101 (100)	138 (100)	34 (100)	62 (100)	93 (100)	81 (100)	74 (100)

The analysis of the frequency of success attributions shown in Table 3 indicated that, in the pre-AR stage, 'Effort' (an internal cause) was the most commonly mentioned cause cited by 37 students (52.2%) in the EG and 26 students (41.9%) in the CG, which was followed by 'Aptitude' (an internal cause) mentioned by 21 students (29.6%) in the EG and 19 students (30.6%) in the CG. As shown in Table 3, few students (ranging from 1.4% to 6.4%) in both groups attributed their success to causes other than 'Effort' and 'Aptitude'. Similarly, in the post-AR stage, 92 students (66.6%) in the EG and 33 (40.7%) students in the CG attributed their success to 'Effort' and 33 students (23.9%) in the EG and 21 (25.9%) students in the CG to 'Aptitude'. In the CG, 'Task characteristics' was the third popular reason to which the participants attributed their success (14 (17.2%)). Likewise, only a few students in both groups (ranging from .7% to about 7%) made attributions to other causes.

On the other hand, the analysis of the frequency of failure attributions shown in Table 3 indicated that, in the pre-AR stage, 25 students (24.7%) in the EG and 22 students (23.6%) in the CG attributed their failure to 'Task Characteristics' (an external, stable cause). The second most commonly cited causal attribution was 'Mood' (an internal, unstable cause) mentioned by 19 students (18.8%) in the EG and 13 students (13.9%) in the CG. Interestingly, in the post-AR stage, 'Effort' was the most commonly mentioned cause cited by 14 students (41.1%) in the EG. Nevertheless, the most commonly mentioned attribution cited by 32 students (43.2%) in the CG was 'Task Characteristics'. This suggests that the AR program directed at participants in the EG in this study was able to change their failure attributions from an external, stable cause ('Task Characteristics', a maladaptive, discouraging causal attribution), which is believed to be the most undesirable causal attribution, to an internal, unstable cause ('Effort', an adaptive, encouraging causal attribution), which is considered to be the most desirable causal attribution (Perry et al., 1993).

To answer the second research question of the study (i.e. Are attributional retraining procedures in videotape format followed by consolidation exercises able to influence Iranian high school students' FL causal attributions in a positive direction?), we used MANOVA and paired-samples *t*-test to compare the frequency of the causal dimensions before and after the treatment (See Tables 4, 5, and 6). As mentioned earlier, casual ascriptions have little bearing on the subsequent cognitions, emotions, and academic achievement, but it is the dimensions by which individuals place the ascriptions which matters most. The CDS-II assesses causal attributions along four dimensions of Locus of Causality, Stability, Personal Control, and External Control. To obtain a total score for each of the subscales, the responses (from 1 to 9) to the individual items are summed (Russell, 1982) (See Appendix A).

Table 4.
Descriptive Statistics for the Differences in Causal Dimensions

	Descriptive Statistics			
	EG		CG	
	Pre-AR Stage	Post-AR Stage	Pre-AR Stage	Post-AR Stage
Dimensions	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
External Control	4.2 (2.5)	2.8 (1.8)	4.6 (2.6)	4.1 (2.2)
Locus of Causality	5.0 (2.6)	7.6 (1.9)	4.8 (2.6)	5.0 (2.2)
Personal Control	4.8 (2.5)	7.5 (2.0)	4.8 (2.6)	5.0 (2.2)
Stability	4.0 (1.7)	7.5 (1.9)	3.8 (1.5)	4.0 (1.5)

Note. The values related to causal dimensions are out of 9.

The descriptive statistics presented in Table 4 shows a change (before and after the intervention) in mean scores of participants in the EG in relation to the four dimensions of the CDS-II including 'External Control' (Mean1= 4.2, Mean2= 2.8), 'Locus of Causality' (Mean1= 5.0, Mean2= 7.6), 'Personal Control' (Mean1= 4.8, Mean2= 7.5), and 'Stability' (Mean1= 4.0, Mean2= 7.5). The participants in the CG also indicated a change in their mean scores in relation to all causal dimensions including 'External Control' (Mean1= 4.6, Mean2= 4.1), 'Locus of Causality' (Mean1= 4.8, Mean2= 5.0), 'Personal Control' (Mean1= 4.8, Mean2= 5.0), and 'Stability' (Mean1= 3.8, Mean2= 4.0).

The results of the paired *t*-tests comparing the mean scores obtained by the participants in both groups in the pre-AR stage with their mean scores in the post-AR stage on all dimensions of the CDS-II are presented in Table 5.

Table 5.
Paired *t*-test Results for the Differences in Causal Dimensions

	Paired *t*-test Results					
	EG			CG		
Dimensions	Pre- to Post-AR Comparison			Pre- to Post-AR Comparison		
	t	*p*	η^2	*t*	*p*	η^2
External Control	13.894	.00	.36	5.329	.00	.08
Locus of Causality	-11.819	.00	.29	-2.477	.01	.01
Personal Control	-12.613	.00	.31	-3.178	.00	.03
Stability	-20.375	.00	.54	-2.211	.02	.01

Note. The values related to causal dimensions are out of 9.

As shown in Table 5, the mean scores of the participants in the EG in the post-AR stage were significantly different from theirs in the pre-AR stage regarding all causal dimensions: 'External Control' (*t*= 13.894, *p*= .00), 'Locus of Causality' (*t*= -11.819, *p*= .00), 'Personal Control' (*t*= -12.613, *p*= .00), and 'Stability' (*t*= -20.375, *p*= .00). Also, the effect sizes were large enough (ranging between .29 and .54) to convince us that the AR treatments influenced their causal attributions in the predicted direction. On the other hand, the participants in the control group also showed some change (*p*= .00 <.05) regarding all causal dimensions, of the CDS-II and their mean scores were statistically significant. However, it should be noted that although the effect size observed for the control group regarding the External Control dimension was moderate ($\eta 2$= .08), they were very small ($\eta 2$= ranging between .01 and .03) and thus ignorable for the other dimensions.

Finally, to compare the participants in the experimental groups with those in the control groups regarding their causal attributions as measured by the four dimensions of the CDS-II before and after receiving the treatment, a series of MANOVAs were applied, the results of which are presented in Table 6.

Table 6.
MANOVA Results for the Differences in Causal Dimensions

Dimensions	**MANOVA Results**					
	Pre-AR Stage			Post-AR Stage		
	F	*p*	η^2	*F*	*p*	η^2
External Control	1.76	.18	.00	32.87	.00	.09
Locus of Causality	.95	.32	.00	120.52	.00	.27
Personal Control	.02	.86	.00	114.71	.00	.26
Stability	.78	.37	.00	319.22	.00	.49

Note. The values related to causal dimensions are out of 9.

As Table 6 suggests, the two groups did not differ significantly (p > .05) regarding their causal attributions on all the four dimensions of the CDS-II prior to receiving treatments. However, statistically significant differences were found for the groups regarding all causal dimensions after the intervention: 'External control' (*F*= 32.87, *P*= .00, *η2*= .09), 'Locus of Causality' (*F*= 120.52, *P*= .00, *η2*= .27), 'Personal Control' (*F*= 114.71, *P*= .00, *η2*= .26), 'Stability' (*F*= 319.22, *P*= .00, *η2*= .49). Except for 'External Control' which had a moderate effect size (η2= .09), all the other effect sizes were large enough to indicate a significant difference (ranging between .26 and .49).

In addition, to answer the third research question of the study (i.e. Are attributional retraining procedures in videotape format followed by consolidation exercises able to improve Iranian high school students' performance on FL achievement tests?), we used a paired *t*-test to compare the performance of participants in both groups on pre-AR FL achievement test (i.e. mid-term exam) with their performance on post-AR FL achievement tests (final exam). Moreover, an independent samples *t*-test was used to compare the performance of participants in both groups on the pre-AR and post-AR FL achievement tests (See Tables 7 and 8).

Table 7.
Descriptive Statistics and Paired *t*-tests Results Comparing the Performance of Participants in Both Groups on Pre-AR FL Achievement Test with their Performance on Post-AR FL Achievement Test

	Experimental group (N=172)					Control group (N=155)				
Stages	Mean	Std.	*t*	*p*	*η2*	Mean	Std.	*t*	*p*	*η2*
Pre-AR	16.97	1.60	-20.49	.00	.55	16.81	2.08	-8.00	.00	.17
Post-AR	18.88	1.15				17.33	1.76			

Note. The values related to achievement test scores are out of 20.

As Table 7 suggests, participants in the experimental group showed significant improvement (*p*= .00 <.05, *t*= -20.49) regarding their performance on post-AR FL achievement test in comparison to their performance at the pre-AR stage. Also, the magnitude of differences was large enough (*η2*= .55) to indicate a significant difference. Participants in the control group also showed improvement (*p*= .00 <.05, *t*= -8.00). However, the magnitude was much smaller (*η2*= .17) than what was observed for the experimental group.

Table 8.
Independent Samples *t*-tests Results Comparing the Performance of Participants in Both Groups on the Pre-AR and Post-AR FL Achievement Tests

	Pre-AR stage			Post-AR stage		
Groups	*t*	*p*	*η2*	*t*	*p*	*η2*
EG CG	.778	.43	.00	9.478	.00	.21

Note. The values related to achievement test scores are out of 20.

As indicated in Table 8, there were no significant pre-existing differences (p= .43 > .05) between the performance of participants in the experimental and control groups on the FL achievement tests taken before receiving treatment. However, participants in the experimental group differed significantly (p= .00, $\eta 2$= .21) from those in the control group regarding their performance on the FL achievement test after receiving the treatment.

In conclusion, based on the results of the statistical procedures, we might be able to conclude that the AR treatments used in the present study significantly influenced high school students' FL attributions in the predicted order and had a positive impact on their FL achievement.

5. Discussion and Conclusion

The present study investigated the effect of AR procedures on Iranian high school students' FL attributions and performance on FL achievement tests. The study involved two phases: a pilot study to ensure the validity and reliability of the instrument, CDS-II (McAuley et al. 1992), and the main study to collect the required data to answer the research questions.

The first finding of this study was that, regarding success attributions, 'Effort' and 'Aptitude' were the most commonly mentioned causes cited by the majority of the students in both groups before and after receiving the treatments and placebos. Thus, we might be able to argue that the participants typically attributed their success to internal causes (something within themselves) and that the treatment had not been able to cause a significant change in the participants' success attributions. However, in case of failure attributions, 'Task Characteristics' and 'Mood' (two uncontrollable causes) were found to be the most commonly mentioned causes by participants in both groups before receiving the treatments and placebos. The same attributions were mentioned by participants in the CG after receiving placebos. However, the majority of the participants in the EG attributed their failure to 'Effort'. Therefore, we might be able to argue that AR treatments were able to change their failure attributions from an external, stable cause (i.e. 'Task Characteristics', a maladaptive, discouraging causal attribution), which is believed to be the most undesirable causal attribution, to an internal, unstable cause (i.e. 'Effort', an adaptive, encouraging causal attribution), which is considered to be the most desirable causal attribution (Perry et al., 1993).

The results of this study, in general, provided further support for previous research (e.g. Hall et al., 2004; Haynes et al., 2009; Morris, 2013; Ruthig et al., 2004) concerning the favorable effects of AR treatments on students' causal attributions. The results of this study corroborated those of Hall et al. (2004) who asserted that AR techniques would lead to significant improvement in students' motivation and academic achievement. Similarly, this study suggested that AR treatments would positively influence high school students' FL attributions and comparatively improve their FL achievement. As a matter of fact, the AR treatments presented to participants in the EG, as proposed by Perry et al. (1993), were designed in such a way to change external, uncontrollable attributions to more internal and controllable ones (e.g., effort). The results suggested that the AR treatments employed in the present study proved to have been effective in doing so, which also provides support for previous research (e.g., Weiner, 2006; Haynes et al., 2009; Morris, 2013, Perry et al., 1993; Struthers & Perry, 1996) that emphasized the variable

nature of causal attributions. The results also corroborated those of Haynes et al. (2009) in that the AR procedures designed particularly for the present study proved successful in changing undesirable causal attributions for failure (e.g., 'Task difficulty') to more desirable ones (e.g., 'Effort'), an argument which was also maintained by (Perry et al., 1993). Since the present study followed a pre-test post-test control group design, we were able to investigate if the changes observed in the performances of the participants in the EG were due to the treatments. As the results suggest, regarding their causal attributions after receiving the placebos, participants in the CG displayed some change in only one of the four dimensions of the CDS-II (i.e. External Control), and their change in other three scales was not considerable. This provides additional support for our argument that AR treatments exercises might be able to positively influence high school students' FL attributions.

The results also indicated that although participants in the CG showed some improvement regarding their performance on the FL achievement test after receiving the placebos, its magnitude was ignorable in comparison to the improvement observed for the participants in the EG. As a result, we argue that AR treatment exercises might be able to improve high school students' FL achievement. More specifically, the comparison between the performance of participants in the EG and that of the participants in the CG in this study indicated that those who attributed their success or failure to internal, controllable causes (e.g., 'Effort') outperformed those who displayed a tendency toward external, uncontrollable causes (e.g. 'Task difficulty') on FL achievement tests. This finding is in line with that of Pishghadam and Zabihi (2011) who found that learners who attributed their academic success or failure to 'Effort' achieved higher grades on FL achievement tests. It also corroborates Hashemi and Zabihi's (2011) finding that effort attribution was the best predictor of high grades on high English language proficiency scores. As a result, we might be able to argue that AR treatment exercises seem to have the potential to influence high school students' FL achievement. This might be due to the fact that when students perceive academic outcomes under their own control, they will be motivated to take responsibility for their success and academic achievement. On the contrary, if they see the outcomes as uncontrollable, they will lose the required motivation (Hayenes et al., 2009). This is also in line with the findings of Peggy Hsieh and Schallert (2008) who maintained that students who believe their successful performance is due to their high ability will probably achieve more in the future because such beliefs are conducive to feelings of pride, higher expectations for success, and more persistence. In this regard, Weiner (2006, 2010) asserted that personal attributions for success or failure can be altered to have a remarkable positive influence on future performance. Our results corroborate Weiner's claim and provide support for Morris's (2013) findings that students who were exposed to AR treatments made more external and unstable attributions for hypothetical failure events than those who did not.

6. Implications

The results of this study may have some implications for school psychologists and teachers. Since attributions influence one's expectations for future success, their motivation, and the amount of effort they will make in order to accomplish future tasks, designing programs to introduce them periodically to students seems essential. The AR techniques, in fact, must be aimed at encouraging success and failure attributions to internal, controllable causes such as effort. According to attribution theory, students' past experiences influence their ability to control their future performances. For instance, if they fail a test and attribute the cause to external, uncontrollable causes such as luck or task difficulty, they will be unlikely to engage in subsequent learning activities.

As mentioned previously, one of the school subjects which many students around the world experience failure in is English learned as a foreign language (Ushioda, 2001). One solution to this problem, according to Ushioda (2001), is attributional procedures. Based on the results of the present

study, along with those of previous research, school psychologists and teachers should attempt to influence students' causal attributions through designing AR treatments to be introduced periodically to students, specifically to unmotivated and underachieving ones. In this regard, attributional information conveyed to students in videotape format followed by consolidation activities such as class discussions proved in this study to be useful techniques that can be employed by school psychologists for such a purpose.

Moreover, since parents contribute to their children's academic motivation and attributions, school psychologists are also advised to devise attributional programs to be directed at parents as well. A parent might react to a child's low grade in math, for instance, by saying, 'It doesn't matter. I know math is too difficult,' while another parent might say, 'This grade doesn't reflect your true ability and intelligence. You might not have tried hard enough. Anyway, I expect you to improve your performance on the next test.' In fact, the first comment might lead the child to attribute the failure to external, uncontrollable causes, whereas the second one will probably lead the child to attribute the failure to internal, controllable causes. These comments originate from parents' own beliefs about the causes of failures. Thus, it seems advisable that school psychologists also make parents aware of the power they have in influencing their children's attributions.

7. Limitations and Future Research Directions

One limitation of the present study was that we used the available AR videos with English content because there were not available in the participants' native language (i.e. Persian). However, as mentioned earlier, to partly alleviate this problem, we made certain that the language (i.e. content and structure) used in the original AR videos was not complex and thus understandable to the student participants. Moreover, the videos were played twice, once without giving any translations and once with Persian translation, in order to give all the participants equal chance to benefit from the videos. However, it is likely that students with higher English language proficiency might have benefited more from watching them. Thus, one suggestion for further research is to develop videos in the students' native language to provide a less biased intervention. Another limitation of this study is that participants were required to cite only one predominant cause for their performance. Further research, however, should allow students to make multiple attributions and mention various causes for both their success and their failure in their FL achievement.

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Appendix A

Causal Dimension Scale II (CDS-II)

►Please write the result of your English mid-term/final exam announced to you a few days ago: .....out of 20.
►Do you perceive your grade as success or failure? ……
►To what do you attribute the causes for your performance (success or failure) on the exam? .....

Instructions: Think about the reason or reasons you have written above. The items below concern your impressions or opinions of this cause or causes of your performance. Circle one number for each of the following questions.
Is this cause (s) something:

1. That reflects an aspect of yourself	9	8	7	6	5	4	3	2	1	reflects an aspect of the situation
2. Manageable by you	9	8	7	6	5	4	3	2	1	not manageable by you
3. Permanent	9	8	7	6	5	4	3	2	1	temporary
4. You can regulate	9	8	7	6	5	4	3	2	1	you cannot regulate
5. Over which others have control	9	8	7	6	5	4	3	2	1	over which others have no control
6. Onside of you	9	8	7	6	5	4	3	2	1	outside of you
7. Stable over time	9	8	7	6	5	4	3	2	1	variable over time
8. Under the power of other people	9	8	7	6	5	4	3	2	1	not under the power of other people
9. Something about you	9	8	7	6	5	4	3	2	1	something about others
10. Over which you have power	9	8	7	6	5	4	3	2	1	over which you have no power
11. Unchangeable	9	8	7	6	5	4	3	2	1	changeable
12. Other people can regulate	9	8	7	6	5	4	3	2	1	other people cannot regulate

Scoring: The total scores for each dimension are obtained by summing the items, as follows: 1, 6, and 9 = locus of causality; 5, 8, and 12 = external control; 3, 7, and 11 = stability; 2, 4, and 10 = personal control.