

*Unconscious motivation.  
Part II: Implicit attitudes and L2 achievement*

Ali H. Al-Hoorie

School of English, The University of Nottingham, UK

The English Language Institute, Jubail Industrial College, Saudi Arabia

[hoorie\\_a@jic.edu.sa](mailto:hoorie_a@jic.edu.sa)

Abstract

This paper investigates the attitudinal/motivational predictors of second language (L2) academic achievement. Young adult learners of English as a foreign language ( $N = 311$ ) completed several self-report measures and the Single-Target Implicit Association Test. Examination of the motivational profiles of high and low achievers revealed that attachment to the L1 community and the ought-to L2 self were negatively associated with achievement, while explicit attitudes toward the L2 course and implicit attitudes toward L2 speakers were positively associated with it. The relationship between implicit attitudes and achievement could not be explained either by social desirability or by other cognitive confounds, and remained significant after controlling for explicit self-report measures. Explicit-implicit congruence also revealed a similar pattern, in that congruent learners were more open to the L2 community and obtained higher achievement. The results also showed that neither the ideal L2 self nor intended effort had any association with actual L2 achievement, and that intended effort was particularly prone to social desirability biases. Implications of these findings are discussed.

*Keywords:* motivation; implicit attitudes; Implicit Association Test; social desirability; explicit-implicit correspondence

## 1. Introduction

Although second language (L2) motivation research has made impressive advances since Gardner and Lambert's (1959) seminal study, one notable trend has been by and large constant: Motivation is conceptualized as a conscious factor, one that learners are aware of and can therefore exert considerable control on (e.g., Al-Hoorie, 2016a; Dörnyei & Ushioda, 2011). This is certainly in line with a more general trend in motivational psychology since the cognitive revolution. Recently, however, more and more significance has been attached to the unconscious side of motivation in mainstream motivational psychology (e.g., Al-Hoorie, 2015; R. M. Ryan, 2012). The aim of this paper is to examine whether the L2 motivation field would also benefit from attention to unconscious approaches to human motivation.

A second notable trend in much of the recent L2 motivation literature has been the tendency to avoid using L2 achievement as a criterion measure (e.g., Moskovsky, Assulaimani, Racheva, & Harkins, 2016). This trend may be traced back to Csizér and Dörnyei's (2005) call for "increased theoretical clarity" since "motivation is a concept that explains why people behave as they do rather than how successful their behavior will be" (p. 20; see also Dörnyei, 2001). Dörnyei and Ushioda (2011) have more explicitly advocated this motivation-behavior-achievement theoretical clarity, stating that achievement may be "the wrong criterion measure" (p. 200) for motivation studies.

More recently, an alternative point of view is to emphasize that, after all, the "ultimate aim of motivation research is always to explain student learning" (Dörnyei & Ryan, 2015, p. 101) and "ultimately, SLA is about achievement" (Moskovsky et al., 2016, p. 643). Indeed, while it is true that motivation is more strongly associated with behavior rather than achievement, it is also useful to examine the different attitudinal/motivational factors in order to distinguish the ones whose explanatory power is limited to (self-reported) motivated behavior from those whose explanatory power extends to actual learning and achievement. This will appraise the strength of each motivational variable. This is an issue that Ellis (2009) has raised, describing it as "really needed" (p. 108) now. This is especially important since certain motivational constructs have already been shown to predict academic achievement successfully, such as integrative motivation ( $r = .33-.39$ , Masgoret & Gardner, 2003, Table 4) and self-efficacy ( $r = .38$ , Multon, Brown, & Lent, 1991, p. 34). This study therefore included a measure of achievement in the spirit of the proof of the pudding.

This study also utilized the L2 motivational self system (L2 MSS; Dörnyei, 2005, 2009) as a theoretical framework because it is currently the most influential theory of L2 motivation (Boo, Dörnyei, & Ryan, 2015). The L2 MSS postulates

three factors: the ideal L2 self, the ought-to L2 self, and the L2 learning experience. According to this theory, the ideal L2 self is “a central component” (Dörnyei, 2009, p. 67) and “the key concept” (Dörnyei & Ryan, 2015, p. 87). The ideal L2 self should therefore be the prime candidate to have a robust effect extending to achievement.

### 1.1. Achievement in L2 motivation research

Contrary to claims in the literature (e.g., Thompson & Vásquez, 2015, pp. 159-160), the L2 MSS has not been tested extensively in the context of actual L2 achievement, and so its educational relevance is not yet established. Probably following the above call for theoretical clarity—and probably due to its convenience—there has been a paucity of research utilizing measures of actual L2 achievement in the L2 MSS literature. Indeed, the original argument in favor of the ideal L2 self equates self-reported “intended effort” with the “criterion measure”: “The Ideal L2 Self was consistently found to correlate highly with the criterion measure (Intended effort), explaining 42% of the variance” (Dörnyei, 2009, p. 31).

In the few exceptions that did include a form of L2 achievement (e.g., Dörnyei & Chan, 2013; Eid, 2008; Kim & Kim, 2011; Lamb, 2012; MacIntyre & Serroul, 2015; Moskovsky et al., 2016), the results are not optimistic. In the two languages they examined, Dörnyei and Chan (2013) reported a relatively strong correlation between the Mandarin ideal L2 self and grades in Mandarin ( $r = .42$ ), but a weaker correlation between the English ideal L2 self and school grades in English ( $r = .24$ ), a correlation that is barely higher than the correlation between the English ideal L2 self and *Mandarin* grades ( $r = .17$ ). Eid’s (2008) results paint a similarly mixed picture, in that the three languages she examined varied in how strongly they correlated with their respective grades ( $r = .17-.46$ ). Cross-language overlap was also obtained by Eid (2008), as she found significant correlations between the *French* ideal self and *Italian* grades ( $r = .35$ ) and between the Italian ideal self and French grades ( $r = .31$ ), despite “the growing consensus in the field of L2 motivation that coexisting ideal L2 self images constitute fairly distinct L2-specific visions” (Dörnyei & Chan, 2013, p. 455). Following the motivation-behavior-achievement theoretical clarity, it is possible that observed correlations between the ideal L2 self and achievement would decrease once we control for potential mediators, such as motivated behavior and the L2 learning experience (cf. Papi, 2010; Taguchi, Magid, & Papi, 2009).

In a direct demonstration of this, Kim and Kim (2011) initially had a significant correlation between the ideal L2 self and achievement, but this association disappeared after controlling for motivated behavior. Kim and Kim (2011) note that “being motivated by developing a vivid ideal L2 self through a dominant

visual preference seems to be irrelevant to the level of academic achievement" (p. 36). Interestingly, the auditory—rather than the visual—learning style remained a significant (though weak) predictor of achievement. Kim and Kim (2011) explain the unexpected superiority of the auditory preference by drawing from Kim's (2009) provocative argument that, because L2 is an essentially verbal ability, auditory preference might lead to more sensitivity in noticing L2 proficiency gaps. A second finding in Kim and Kim's (2011) study is that intended effort also turned out to be a weak predictor of achievement, accounting for "merely 5.7%" (p. 37) of the variance. Kim and Kim (2011) concluded by expressing their disappointment that "the effect was not prominent enough to [support] its educational relevance . . . demotivated students may have an equal chance to earn a high English test score" (p. 38).

Consistent with Kim and Kim's (2011) results, Lamb (2012) used a C-test as a measure of L2 proficiency and found that the ideal L2 self could not predict achievement in any of his groups. When it comes to motivated behavior, the ideal L2 self also failed to predict it in two of three groups. In the group where the ideal L2 self did predict motivated behavior, the magnitude of the prediction was modest. In Lamb's (2012) words, the ideal L2 self explained "only 25% of the variance, compared to the more than 40% which Dörnyei and Ushioda (2011) argue is 'typically' found in other recent studies" (p. 1014). MacIntyre and Serroul (2015) also tested the effect of the ideal L2 self on actual L2 performance in their idiodynamic paradigm, which examines individual motivational variability on a per-second timescale. In line with the above findings, MacIntyre and Serroul (2015) found "no evidence" (p. 126) that the ideal L2 self is associated with idiodynamic ratings. In at least one study (Moskovsky et al., 2016), the ideal L2 self was a *negative* predictor of language achievement. Moskovsky et al. expressed their surprise that their results "suggest the unusual conclusion that learners with low ideal selves, low [positive L2 learning experience], and low [intended learning effort] are likely to achieve higher scores on L2 proficiency tasks" (p. 649; for further critiques of the ideal L2 self, see Gardner, 2010; Henry & Cliffordson, 2015; Hessel, 2015; Lanvers, 2016; Motha & Lin, 2014; Taylor, 2013, pp. 31-33). It is also worth noting that the ought-to L2 self has similarly been inconsistent, sometimes showing a negative association with L2 achievement (e.g., Eid, 2008). Although a systematic meta-analysis of the contribution of the L2 MSS is yet to be conducted, the emerging picture points to the idea that "self-reported motivation does not always have behavioral consequences" (Moskovsky et al., 2016, p. 641).

One explanation for this unsatisfactory predictive validity is the role played by hidden moderators (e.g., low aptitude, inappropriate strategies, poor instruction) that can undermine motivated behavior (Dörnyei & Ushioda, 2011).

Another explanation has to do with the role played by the unconscious dimension of behavioral intent. In stressing the influence of such unconscious factors, some researchers have questioned the very validity of conscious self-reports—or at least their prestigious status. For example, a meta-analysis by Connelly and Ones (2010) shows the unexpected finding that ratings by *others* yield “substantially greater” (p. 1092) predictive validity of academic achievement than do self-reports. This suggests that researchers are sometimes better off asking other people about an individual’s motivation (e.g., classmates and teachers) than directly asking the individual about his/her own motivation! This finding might be attributable to at least two factors: implicit attitudes and social desirability. These two factors are discussed next.

## 2. Implicit attitudes

Implicit (i.e., unconscious) attitudes are “introspectively unidentified (or inaccurately identified) traces of past experience that mediate favorable or unfavorable feeling, thought, or action toward social objects” (Greenwald & Banaji, 1995, p. 8). Neuroscientific evidence lends support to the claim that implicit and explicit attitudes are indeed two distinct constructs. According to Cunningham et al. (2004), implicit attitudes correlate with activation in the amygdala, the brain region concerned with emotions, while explicit processing is associated with activation in the frontal cortex, the area responsible for control and regulation (see also Cunningham, Johnson, Gatenby, Gore, & Banaji, 2003; Phelps et al., 2000).

This explicit–implicit dissociation is explained by dual-process theories of cognitive functioning, which posit two simultaneous—but qualitatively different—kinds of mental processes (e.g., J. W. Sherman, Gawronski, & Trope, 2014). *Associative processes* form the basis of implicit attitudes through affective reactions that are automatically and efficiently activated once a relevant stimulus is encountered; *propositional processes* form the basis of explicit attitudes deriving rational judgments based on conscious, logical reasoning. This dissociation implies some independence between explicit and implicit attitudes, in that each might be associated with different types of outcome. Indeed, while explicit attitudes might be better predictors of outcomes requiring intentional decision-making, implicit attitudes tend to exert their influence in more spontaneous situations (Fazio, 2001; Strack & Deutsch, 2004). At an extreme, this dissociation may be seen as “a split in consciousness, such as mutually unaware person systems occupying the same brain” (Greenwald & Nosek, 2009, p. 65). When it comes to learning the language of another ethnic/racial community, there might similarly be implicit, not just explicit, processes in operation.

## 2.1. Development of implicit attitudes

Attitudes in general form very early, even before birth, through genetic factors (Bouchard et al., 2003) and through sounds heard while still in the womb (DeCasper & Spence, 1986). After birth, attitudes are influenced by various factors (for a review, see Banaji & Heiphetz, 2010). One influential account of these influences is social learning theory (Bandura, 1977), according to which children learn from observing others. Research shows an association between children's and parents' attitudes (for a meta-analysis, see Tenenbaum & Leaper, 2002). The same principles seem to apply to implicit attitudes (Sinclair, Dunn, & Lowery, 2005), but relatively little research has investigated this topic. This study therefore included a measure of parental support of L2 learning in order to examine its relation to L2 implicit attitudes.

## 2.2. Implicit attitudes in L2 motivation

In a first attempt to extend research on implicit attitudes to the L2 field, Al-Hoorie (2016a) used the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) as a measure of attitudes toward L2 speakers. Al-Hoorie found that, after holding constant explicit attitudes toward L2 speakers, L2 learners who had stronger implicit preference for L2 speakers (i.e., explicit–implicit congruence) also expressed stronger affiliation with the L2 group as well as less fear of assimilation and ethnocentric concerns. These results demonstrate that implicit attitudes are related to other attitudinal/motivational factors. One purpose of the present study is to extend this line of research to examine the relevance of implicit attitudes to L2 achievement. Because Al-Hoorie's (2016a) results were more salient for male rather than female learners, this study recruited an all-male sample in order to examine this effect more closely. Finally, this study also used the Single-Target Implicit Association Test (ST-IAT; Wigboldus, Holland, & van Knippenberg, 2005), which is a variation of the original IAT that does not require a contrasting category.

## 3. Social desirability

While research on implicit attitudes suggests that individuals may possess negative implicit attitudes toward *specific* social objects, social desirability proposes that some individuals have a more general tendency to present themselves favorably, and so they tend to exaggerate their views of themselves, for example, in their questionnaire responses. In presenting their impression management theory, Tedeschi, Schlenker, and Bonoma (1971, p. 690) explain that “we are

postulating that it is not the actor's own perceptions that matter so much as the actor's beliefs about the impression that an observer gains." In other words, individuals might tend to inflate their self-reports in order to obtain more favorable impressions from others. This is what investigators found when they examined self-reports that could be verified independently, such as one's weight and height. For example, obese and overweight adolescents tend to misreport their weight, and this misreporting is consistently in the direction of underestimating their weight, so that they look skinnier (Elgar, Roberts, Tudor-Smith, & Moore, 2005). Women of reproductive age also underestimate their weight, and this happens regardless of their age, education, race, or marital status (Brunner Huber, 2007). The misreporting is more frequently found in the responses of overweight individuals, who usually have a stronger desire to present themselves more positively. When height is reported, as might be expected, it is misreported in the opposite direction; people overestimate their height to look taller (e.g., Rowland, 1990). Although the magnitude of misreporting varies (e.g., see Spencer, Appleby, Davey, & Key, 2002), it is clear that the distortion is consistently self-enhancing.

More crucially, impression management theory developed from cognitive dissonance theory (Festinger, 1957), and so individuals may not be consciously "fabricating" their responses in order to deliberately enhance their self-image. Instead, they are probably engaged in an automatic process to resolve a dissonance that they are experiencing, without even being aware of it (e.g., "*I think I am good-looking, so I must be skinny*"). Thus, this process is probably operating unconsciously. That these participants were unaware of this process may be supported by the fact that they were usually aware that their weight and height were going to be checked afterward and their self-reports verified, which should have functioned as an incentive to provide as accurate responses as possible. Based on this, it is not unreasonable to expect people to also provide impression-management-biased responses when it comes to more sensitive issues, such as their own motivation and diligence or their attitudes toward another ethnic or racial group. The present study therefore included a measure of social desirability.

### 3.1. The Crowne-Marlowe Scale

Crowne and Marlowe (1960) devised a social desirability scale consisting of 33 true-false statements related to behaviors that are socially undesirable but that people nonetheless typically engage in routinely. Examples included "I like to gossip at times" and "I am sometimes irritated by people who ask favors of me." Individuals who score highly on this scale may have a general tendency to exaggerate their questionnaire responses.

Despite some controversy (e.g., Johnson, Fendrich, & Mackesy-Amiti, 2012), a growing literature is showing that social desirability is associated with various meaningful outcomes. For example, Barger (2002) reviewed research showing that the social desirability scale predicts hypertension, cortisol levels, cholesterol, autonomic nervous system reactivity, lifetime psychiatric morbidity, and mortality following a cardiac event. Because of the length of this scale (i.e., 33 items), some researchers have tried to subdivide it into three shorter versions. However, in a large-scale study, Barger (2002) questioned these shorter versions. This study therefore used the full version.

### 3.2. Social desirability in L2 motivation

If a scale is sensitive to social desirability, that could be a reason for concern. In recognition of this, some early studies of L2 motivation did examine social desirability. For example, while Gardner, Lalonde, and Moorcroft (1985) argued that there was “virtually no evidence” (p. 219) of an association between the Attitude/Motivation Test Battery and social desirability, Gardner and Glikzman (1982) reported that it had a correlation of .40 with motivational intensity, a magnitude the authors described as “substantial” (p. 197). To the extent that the “intended effort” scale is concerned with motivated behavior, it is conceptually similar to Gardner’s “motivational intensity.” Therefore, it is possible that intended effort would similarly be prone to social desirability.

In a subsequent study, Gardner and MacIntyre (1991) utilized a measure of social desirability but it resulted in a very low internal consistency coefficient ( $\alpha = .23$ ), which the authors attributed to the use of Likert items instead of the original true-false format. Because of this, this study used the original dichotomous response format.

## 4. Research foci

The present study aimed to achieve two main goals. The first goal was to compare the motivational profiles of L2 learners with different academic achievement levels. The aim was to find out which motivational variables would be able to successfully discriminate between high versus low achievers. The second goal was to replicate Al-Hoorie’s (2016a) study in order to find out whether the results would hold with a different sample, with a different instrument, and when controlling for social desirability. More specifically, congruent learners (i.e., those with positive attitudes toward L2 speakers both explicitly and implicitly) were expected to show more affiliation with the L2 group than would incongruent learners (i.e., those with positive explicit, but negative implicit attitudes). This study also attempted to find out whether this pattern would extend to L2 achievement.

In addition, there is some controversy surrounding what IAT-type tests are actually measuring (e.g., Greenwald, Banaji, & Nosek, 2015; Oswald, Mitchell, Blanton, Jaccard, & Tetlock, 2013; Rudman, 2008). For example, do individuals who perform faster really possess more positive implicit attitudes, or is this simply because of their better task-switching skills or working memory capacity? Or is it that learners who score higher are the “good” students who take the implicit test seriously, while the low scores of others merely reflects careless performance? It could also be that those who perform better simply want to appear favorably, such as to please teachers and experimenters. To address such potential confounds, social desirability was included as an explicit control, and an additional implicit test was used as an implicit control. The additional implicit test targeted attitudes toward the L2 course. If the implicit scores are a result of the above confounds and artifacts (e.g., having better cognitive ability or taking the test more seriously), this should apply equally to the two tests and therefore conclusions derived from them should be very similar. In order for the implicit tests to show discriminant validity, it was expected that implicit attitudes toward L2 speakers would be related to L2 group affiliation, but implicit attitudes toward the L2 course (which reflect the here and now) would not.

Finally, a measure of parental support was included in order to explore its relationship with explicit and implicit attitudes.

## 5. Method

### 5.1. Participants

A total of 311 participants qualified for the final analysis after excluding those who did not complete all study tasks or who responded randomly to the implicit test (see the data analysis section for details). The qualifying participants (18-24 years old,  $M = 19.8$ ,  $SD = 0.95$ ) were Arabic L1 males studying English as a foundation-year requirement at an all-male higher education institution in Saudi Arabia. The majority (over 85%) had never visited an English speaking country. Less than 10% had lived in an English speaking country for a maximum of three months, while less than 5% had stayed there for a longer duration. All participants took part in the present study on a voluntary basis.

### 5.2. Materials

#### 5.2.1. Implicit measures

The ST-IAT was adapted to measure attitudes toward L2 speakers and toward the L2 course separately. Performing the ST-IAT requires pressing a left or right

button on the keyboard in order to rapidly categorize a series of stimuli appearing in the center of a computer screen. Table 1 gives an overview of the L2 Speakers ST-IAT. In the first block, the participants practiced categorizing words as *Pleasant* or *Unpleasant* 20 times. Then the actual test started. In the first condition, Blocks 2 and 3, *Pleasant* was paired with *L2 Speakers*, as shown in Figure 1. In the other condition, Blocks 4 and 5, *L2 Speakers* moved to the other side to pair up with *Unpleasant*. Before each block, the participants read instructions and were reminded to perform as fast as possible. The L2 Course ST-IAT followed the same format but used *L2 Course* in place of *L2 Speakers* (see the appendix for the stimuli used). Each ST-IAT took less than 10 minutes to complete.

Table 1 Overview of the L2 Speakers Single-Target Implicit Association Test

Block	Trials	Function	Response key assignment	
			Left button (E)	Right button (I)
1	20	Practice	Pleasant	Unpleasant
2	40	Test 1a	Pleasant or L2 Speakers	Unpleasant
3	80	Test 1b	Pleasant or L2 Speakers	Unpleasant
4	40	Test 2a	Pleasant	Unpleasant or L2 Speakers
5	80	Test 2b	Pleasant	Unpleasant or L2 Speakers

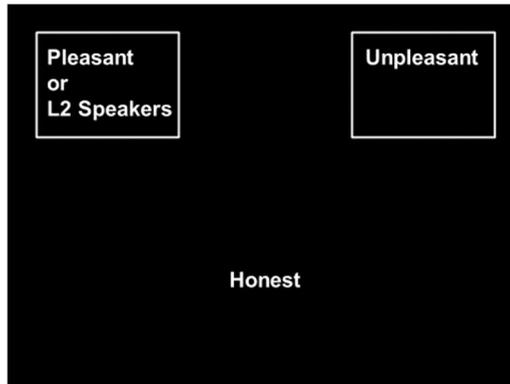


Figure 1 A trial of the L2 Speakers ST-IAT. The correct answer here would be the left button (E) because the stimulus *Honest* belongs to *Pleasant*.

The stimuli were randomly drawn without replacement from *Pleasant*, *Unpleasant*, and *L2 Speakers* or *L2 Course* where appropriate. A red X appeared when an incorrect response was given, and the participant had to correct the error before proceeding. Split-half analyses based on even-versus-odd trials showed that both the L2 Speakers ST-IAT (Spearman-Brown's  $\rho = .73$ ) and the L2 Course ST-IAT ( $\rho = .72$ ) had good reliabilities. The ST-IAT scores were coded so that a higher score reflected a more positive attitude. The software used was Inquisit 4 (2014).

### 5.2.2. Explicit measures

The participants also completed 10 self-reported attitudinal and motivational scales relevant to explicit and implicit dispositions:

1. The Ideal L2 Self (4 items, Cronbach's  $\alpha = .80$ ). Example: "I can imagine myself mastering English one day."
2. The Ought-to L2 Self (4 items,  $\alpha = .65$ ). Example: "I must study English because it will earn me respect in the society."
3. Intended Effort (5 items,  $\alpha = .67$ ). Example: "I am prepared to expend a lot of effort in learning English."
4. Family Support (4 items,  $\alpha = .57$ ). Example: "My parents encourage me to study English."

A higher score in each of the above four scales indicated stronger endorsement. Three other scales were concerned with the degree of affiliation with the L1 group:

5. Fear of Assimilation (5 items,  $\alpha = .72$ ), adapted from S. Ryan (2009). Example: "I think that the interest in the West has a negative influence on the Arab culture."
6. Ethnocentrism (2 items,  $\alpha = .59$ ), adapted from Neuliep and McCroskey (1997). Example: "I find it difficult to work together with people who have different customs."
7. Religious Attitudes (6 items,  $\alpha = .78$ ), adapted from Al-Hoorie (2016a). Example: "When I see a non-Muslim, the idea of sharing my Islamic faith with them comes to my mind immediately."

A higher score in each of these three scales reflected stronger L1 affiliation. The above seven scales all involved 7-point Likert scales.

8. Social Desirability (28 true–false items,  $\alpha = .66$ ), adapted from Crowne and Marlowe (1960). Example: "My table manners at home are as good as when I eat out in a restaurant."

A higher score in this scale reflected higher social desirability. Finally, the participants also responded to two semantic differential scales:

9. Attitudes Toward L2 Speakers (10 bipolar adjective scales,  $\alpha = .82$ ), concerned with individuals whose L1 is English.
10. L2 Learning Experience (8 bipolar adjective scales,  $\alpha = .87$ ), concerned with attitudes toward the L2 course.

The adjectives used in these two scales were based on the stimuli of implicit tests (see the appendix).

The above scales were also submitted to Mokken scale analysis using MSP5 (Molenaar & Sijtsma, 2000) to ascertain their discriminant validity and unidimensionality, and all of them satisfied these two criteria. Social desirability was three-dimensional as expected but was left intact in order to use the full version as explained above. All materials in the explicit and implicit measures were translated into Arabic to avoid language interference.

### 5.3. Procedure

The participants completed the study tasks in small groups in a laboratory. The participants were informed at the beginning that the current study was part of a research project at a British university, which incidentally might have activated their social desirability. Each participant first responded to items randomly drawn in a fixed order from the seven Likert scales, and then to the L2 speakers and to L2 learning experience semantic differential scales. Afterwards, they completed the two implicit measures with the social desirability scale in between. The order of the two implicit tests was counterbalanced, but this did not have an effect on responses either to the L2 Speakers ST-IAT ( $d = 0.02$ ) or to the L2 Course ST-IAT ( $d = 0.05$ ).

The participants' final achievement in the L2 course (on a 9-point scale ranging from A+ to F) was obtained. One particular difficulty in using real-life course grades is that the researcher is rarely in full control of the process. On the other hand, as explained above, examining real-life academic achievement is also important because it is a meaningful outcome in educational settings. As an additional step to make the achievement variable more interpretable, learners were considered high achievers if they obtained A or B, and low achievers if they obtained D or F. This procedure excluded learners in the middle, gray area. Still, because it might seem artificial, this dichotomization procedure was used only when the aim was to compare high versus low achievers. The full 9-point achievement measure was used for the rest of the analysis. As detailed below, both approaches led to positive results supporting the relevance of implicit attitudes.

### 5.4. Data Analysis

The analysis of the implicit tests closely followed the improved scoring algorithm, called the *D* Measure, recommended by Greenwald, Nosek, and Banaji (2003). The four test blocks were included in the analysis, and the latency of each incorrect response was replaced with the block mean plus 600 ms error

penalty. Participants with more than 10% latencies faster than 300 ms—an indication of random responding—were excluded, while responses longer than 5,000 ms were removed. The responses from the social desirability scale were summed to obtain a score with a maximum of 24. All other measures, explicit and implicit, were rescaled so that they centered on zero and ranged from +3 to -3.

## 6. Results

### 6.1. Descriptive statistics

The first two columns in Table 2 present the descriptive statistics of the variables in this study. Each of the core variables in the L2 MSS—the Ideal L2 Self, the Ought-to L2 Self, the L2 Learning Experience, and Intended Effort—was highly endorsed by the participants and showed relatively high inter-correlations. Intended Effort also had the strongest correlation with social desirability. As expected, Fear of Assimilation, Ethnocentrism, and Religious Attitudes also correlated with each other.

Table 2 Means, standard deviations, and Pearson product-moment correlations among the variables in the study ( $N = 311$ )

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12
1. Ideal L2 Self	2.18	0.82	—											
2. Ought-to L2 Self	2.07	0.88	.14**	—										
3. Family Support	1.96	0.90	.25***	.21***	—									
4. Fear of Assimilation	0.51	1.26	-.05	-.08	.08	—								
5. Ethnocentrism	-0.44	1.41	-.09	.05	.09	.21***	—							
6. Religious Attitudes	1.22	1.10	.19***	.09	.28***	.50***	.25***	—						
7. Attitudes to L2 Speakers	1.10	0.83	.13	.22***	.06	-.15**	-.08	-.09	—					
8. L2 Speakers ST-IAT	0.27	0.36	.01	.08	.13*	-.08	-.03	.01	-.03	—				
9. L2 Learning Experience	1.18	1.09	.33***	.20***	.15**	-.09	.00	.06	.26***	.01	—			
10. L2 Course ST-IAT	0.56	0.34	.00	.00	-.06	.01	.03	.01	.06	.26***	.02	—		
11. Social Desirability	13.25	3.71	.12	.04	.10	.07	-.10	.16**	.08	-.01	.12*	-.01	—	
12. Intended Effort	1.76	0.89	.38***	.44***	.21***	-.14**	-.13*	.10†	.25***	.12*	.33***	.06	.21***	—
13. Grades	4.22	2.48	.09	-.09	-.12*	-.12*	-.14*	-.22**	.06	.13*	.17*	-.03	-.03	.00

Note. \*\*\* $p \leq .001$ , \*\* $p \leq .01$ , \* $p < .05$ , † $p < .10$ .

Grades are used here in the full 9-point format ranging from A+ to F.

## 6.2. High vs. low achievement

The first goal of this study was to investigate the participants' motivational profiles in order to determine which variables are associated with high versus low achievement. A one-way MANCOVA was conducted to determine the effects<sup>1</sup> of Achievement (high versus low) on the dependent variables with Social Desirability as a covariate. A few outlying values ( $z > \pm 3.3$ ) were detected and removed in order to satisfy univariate normality; no multivariate outliers were found based on Mahalanobis distance scores,  $\chi^2(12) = 32.91, p = .001$ . The homogeneity of variance-covariance matrices was assumed, Box's  $M = 72.89, F = 1.10, p = .27$ . Using Pillai's trace, there was a significant main effect of Achievement,  $V = .186, F(11, 252) = 5.25, p < .001, \eta^2_p = .186$ . There was also a significant main effect of Social Desirability,  $V = .091, F = 2.29, p = .011, \eta^2_p = .091$ .

The lower panel of Table 3 presents the results. Low achievers significantly outperformed high achievers in the first four variables listed in the table: the Ought-to L2 Self, Family Support, Religious Attitudes, and Ethnocentrism. On the other hand, high achievers scored significantly higher in the next two variables: the L2 Speakers ST-IAT (i.e., implicit attitudes toward L2 speakers) and the L2 Learning Experience (i.e., attitudes toward the L2 course). The remaining variables failed to discriminate between the two groups.

The upper panel of Table 3 lists the variables that exhibited proneness to Social Desirability. It is clear that Intended Effort is the most extreme case, while some others were mildly prone to it.

The results in Table 3 suggest that positive implicit attitudes toward L2 speakers are associated with higher achievement. The underlying assumption of implicit attitudes is that they influence behavior without conscious awareness, and therefore their influence is non-self-reportable (Al-Hoorie, 2016b). If this is the case, implicit attitudes should still be able to predict achievement after controlling for the other explicit measures. Hierarchical linear regression was conducted as it would allow investigating the unique variance accounted for by implicit attitudes. This analysis was conducted on the full 9-point achievement measure. The results showed that implicit attitudes towards L2 speakers did predict achievement over and above all the other variables in this study,  $\beta = .19, SE = 0.39, t = 3.33, p = .001$ .

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<sup>1</sup> The use of terms like *effect* and *predict* throughout this paper is intended to be in the statistical sense only. The direction of causality cannot be determined by the design of this study and would require future experimental investigation. This point is discussed further later in the paper.

Table 3 Upper panel: variables exhibiting proneness to Social Desirability as a covariate. Lower panel: MANCOVA results for low and high achievers

	Variable	Group	EMM	SE	F	p	$\eta^2_p$
Social Desirability	Ideal L2 Self				2.93	.088	.011
	Family Support				3.48	.063	.013
	Ethnocentrism				3.73	.054	.014
	Religious Attitudes				5.91	.016	.022
	Intended Effort				12.62	< .001	.046
Achievement	Ought-to L2 Self	Low	2.20	0.072	7.35	.007	.027
		High	1.93	0.070			
	Family Support	Low	2.16	0.073	8.23	.004	.030
		High	1.87	0.071			
	Religious Attitudes	Low	1.49	0.088	12.37	.001	.045
		High	1.06	0.085			
	Ethnocentrism	Low	-0.22	0.122	6.46	.012	.024
		High	-0.65	0.118			
	L2 Speakers ST-IAT	Low	0.20	0.032	5.88	.016	.022
		High	0.31	0.031			
	L2 Learning Experience	Low	0.95	0.089	9.97	.002	.037
		High	1.34	0.086			
	Ideal L2 Self	Low	2.14	0.070	0.74	.389	.003
		High	2.22	0.068			
	Intended Effort	Low	1.80	0.074	0.40	.528	.002
High		1.73	0.071				
Attitudes to L2 Speakers	Low	1.03	0.072	1.37	.243	.005	
	High	1.14	0.069				
Fear of Assimilation	Low	0.62	0.108	1.08	.299	.004	
	High	0.46	0.105				
Course ST-IAT	Low	0.06	0.030	< 0.001	.975	< .001	
	High	0.06	0.071				

Note. The same pattern emerges when the covariate is excluded.  
 EMM = estimated marginal mean, SE = standard error.

Finally, the correlational patterns of Family Support with the other motivational variables were explored. The results are shown in Table 4. The first two columns present the correlations with Family Support for low and high achievers, respectively. The last column tests whether the magnitude of the difference

between these two correlation coefficients is statistically significant. These results show that low achievers tended to associate family support with their ideal L2 selves and their L2 learning experience more strongly than did high achievers, suggesting that low achievers are more susceptible to external influences. This pattern reverses, however, for implicit attitudes toward L2 speakers. High achievers' implicit attitudes were associated more strongly with family support than it was the case for their low-achieving counterparts.

Table 4 Correlation of motivational scales with Family Support for low achievers ( $n = 134$ ) and high achievers ( $n = 140$ )

Scale	$r_{Low}$	$r_{High}$	Z
Ideal L2 Self	.434***	.144†	2.62**
L2 Learning Experience	.311***	.107	1.75†
Intended Effort	.236**	.148†	0.75
Ought-to L2 Self	.203*	.150†	0.45
Attitudes to L2 Speakers	.099	.050	0.40
L2 Speakers ST-IAT	.051	.278***	1.92†

Note. All hypotheses are two-tailed.

\*\*\* $p \leq .001$ , \*\* $p \leq .01$ , \* $p < .05$ , † $p < .10$ .

### 6.3. Congruence vs. incongruence

The purpose of this part of the analysis was to replicate Al-Hoorie's (2016a) results, showing that congruent learners are more open to the L2 community, and to extend these results to L2 achievement. Based on Al-Hoorie's approach, a two-step procedure was applied (see Table 5). First, learners who obtained a score higher than the neutral zero in Attitudes toward L2 Speakers were selected for the analysis. This step satisfied the first column in Table 5 (i.e., positive explicit attitudes). Second, these learners were then divided based on a median-split of their L2 Speakers ST-IAT scores. This two-step procedure generated learners with positive–positive scores (i.e., congruent) and learners with positive–negative scores (i.e., incongruent). The same procedure was followed to obtain congruent and incongruent learners in terms of implicit attitudes toward the course.

Table 5 Illustration of (in)congruence between explicit and implicit attitudes

Explicit attitudes	Implicit attitudes	Type
Positive	Positive	Congruent
Positive	Negative	Incongruent

A two-way MANCOVA was conducted to determine the effects of L2 Speakers Attitudes (congruent vs. incongruent) and L2 Course Attitudes (congruent vs. incongruent) on the dependent variables with Social Desirability as a covariate. As above, outlying values were removed, and no participant violated multivariate normality. The homogeneity of variance-covariance matrices was also assumed, Box's  $M = 33.39$ ,  $F = 1.04$ ,  $p = .40$ . Using Pillai's trace, there was a significant main effect of L2 Speakers Attitudes,  $V = .048$ ,  $F(4, 231) = 2.91$ ,  $p = .022$ ,  $\eta^2_p = .048$ . As expected, there was neither an effect of L2 Course Attitudes,  $V = .014$ ,  $F = 0.80$ ,  $p = .53$ ,  $\eta^2_p = .014$ ; nor a significant interaction,  $V = .017$ ,  $F = 0.98$ ,  $p = .422$ ,  $\eta^2_p = .017$ . There was also a significant main effect of Social Desirability,  $V = .052$ ,  $F = 3.19$ ,  $p = .014$ ,  $\eta^2_p = .052$ . Only Religious Attitudes showed significant susceptibility to Social Desirability,  $F = 8.39$ ,  $p = .004$ ,  $\eta^2_p = .035$ .

The results are shown in Table 6. As expected, the congruent learners scored less in all of Fear of Assimilation, Ethnocentrism, and Religious Attitudes, indicating more openness to the L2 group. Some results are slightly over the conventional .05 threshold, but it has been argued that it is not critical for replication research to satisfy an arbitrary threshold as long as the direction of the effect is maintained (e.g., Anderson & Maxwell, 2016; Nassaji, 2012). A more systematic approach is to meta-analytically synthesize the results from the two studies. The meta-analytic Bayes factors were computed using the BayesFactor R package (Morey & Rouder, 2015) using a 0.30 prior. The results, presented in the last column of Table 6, show support for the hypothesis that congruent learners are more open to the L2 group.

Table 6 MANCOVA results for L2 Speakers Attitudes for congruent ( $n = 112$ ) and incongruent learners ( $n = 125$ )

	Group	EMM	SE	F	p	$\eta^2_p$	B																												
Fear of Assimilation	Cong	0.09	0.166	5.31	.022	.022	182.63																												
	Incong	0.56	0.116					Ethnocentrism	Cong	-0.80	0.203	3.51	.062	0.15	12.85	Incong	-0.33	0.141	Religious Attitudes	Cong	0.97	0.149	3.19	.075	.013	31.68	Incong	1.29	0.103	Grades	Cong	5.04	0.345	5.46	.020
Ethnocentrism	Cong	-0.80	0.203	3.51	.062	0.15	12.85																												
	Incong	-0.33	0.141					Religious Attitudes	Cong	0.97	0.149	3.19	.075	.013	31.68	Incong	1.29	0.103	Grades	Cong	5.04	0.345	5.46	.020	.023	2.75	Incong	4.06	0.239						
Religious Attitudes	Cong	0.97	0.149	3.19	.075	.013	31.68																												
	Incong	1.29	0.103					Grades	Cong	5.04	0.345	5.46	.020	.023	2.75	Incong	4.06	0.239																	
Grades	Cong	5.04	0.345	5.46	.020	.023	2.75																												
	Incong	4.06	0.239																																

Note. Repeating this analysis without the covariate leads to the same results, with the exception that Religious Attitudes drops to non-significance ( $F = 2.15$ ,  $p = .144$ ,  $\eta^2_p = .009$ ). This indicates that the covariate has increased the estimation efficiency.

B = Bayes factor, Cong = Congruent, EMM = estimated marginal mean, Incong = Incongruent, SE = standard error. Note also that Grades are used here as the full 9-point measure.

Still, because there is an element of subjectivity in choosing the prior, sensitivity analysis was conducted using both a lower (0.10) and a higher (0.50) prior. Changing the prior had a negligible effect on the results, indicating that they are stable. Table 6 also shows that congruent learners obtained significantly higher achievement, with the Bayes factor showing support for this hypothesis. Rather than being a meta-analysis, this Bayes factor tests the hypothesis against the null since Al-Hoorie's (2016a) study did not involve a measure of achievement. Again, sensitivity analysis showed that this result is stable.

Finally, because the selection procedure used in the above analyses (i.e., Table 5) might seem artificial, a two-step log-likelihood cluster analysis based on these four variables was conducted on the whole sample. The results readily yielded two clusters with a ratio of 1.03. A *t* test showed that the cluster showing more explicit openness to the L2 group also scored significantly higher in the L2 Speakers ST-IAT,  $t(270) = 2.34, p = .02, d = 0.28$ . The meta-analytic Bayes factor, drawing from the male subsample in Al-Hoorie (2016), also showed substantial support for the hypothesis,  $B = 234.60$ . Again, sensitivity analysis showed that this result is stable. The two clusters had equivalent scores on the L2 Course ST-IAT ( $d = 0.001$ ).

## 7. Discussion

This paper has reported the first study in the L2 field investigating achievement in the context of implicit attitudes, and the results show that implicit attitudes toward L2 speakers successfully and uniquely predict L2 achievement. This study also replicated Al-Hoorie's (2016a) results, showing that explicit-implicit congruence is associated with more openness to the L2 community. The fact that this effect was present only for implicit attitudes toward L2 speakers, rather than toward the L2 course, indicates that these results were not mere artifacts of the learner's cognitive skill or interest in the test, thus lending support to the implicit attitudes construct. Several implications of these results are discussed next.

### 7.1. Attachment to the L1 community

Conventional wisdom (e.g., Gardner, 1985) states that L2 learning is different from other school subjects in that it is social in nature. Therefore, openness to the L2 community (according to the integrative motive) or to L2 speakers in general (the ideal L2 self) is important for successful learning. The results of this study suggest that it may not be enough to focus on openness to the L2 community without also considering the other side of the coin, namely attachment to the L1 community. Strong attachment to the L1 community might be motivated by a sense of threat to one's L1 identity. In this case, learners may need a

sense of security through believing that the L2 does not subtract one's L1 identity (cf. Lambert, 1973; see also García, 2014, for a more dynamic conceptualization).

## 7.2. The ought-to L2 self

The ought-to L2 self turned out to be a negative predictor of L2 achievement (for similar results, see Eid, 2008). In fact, even in the easier task of predicting intended effort, the ought-to L2 self has not consistently lived up to theoretical expectations in empirical research (for similar critiques, see Lamb, 2012, p. 1014; MacIntyre & Serroul, 2015, p. 110). So why is that? Since the ought-to L2 self is concerned with meeting the expectations of *others*, this makes "ought self-guides function more like minimal goals" (Higgins, 1998, p. 5). In line with the suggestion that it concerns minimal goals, the ought-to L2 self has been shown to be associated with the less internalized, preventive forms of motivation (see Dörnyei & Ushioda, 2011, p. 86; Taguchi et al., 2009), which are less likely to sustain engagement in learning and enthusiasm about it. Unlike other theories, such as self-determination theory (Deci & Ryan, 2002), the L2 MSS does not propose different levels of ought-to L2 selves based on degree of internalization (at least in the case of Global English, cf. Dörnyei & Al-Hoorie, in press), or how to empirically operationalize each level. Instead ought-to L2 selves are considered "someone else's vision" (Dörnyei, 2009, p. 14) to perform "the duties and obligations *imposed* [emphasis added] by friends, parents and other authoritative figures" (p. 32). Thus, from this perspective, the ought-to L2 self is distinct from the more internalized forms of extrinsic motivation. Indeed, research shows that the more internalized forms of extrinsic motivation are associated positively with L2 achievement, while the less internalized forms are associated negatively with it (e.g., Wang, 2008). The lack of internalization might help explain why the ought-to L2 self turned out to be detrimental to L2 learning. If this interpretation is correct, a reconsideration of the view that the ought-to L2 self is a positive motivational factor would be in order.

## 7.3. The ideal L2 self

The ideal L2 self could not predict L2 achievement in this study. Although the empirical research supporting the ideal L2 self has been "straightforward" (Dörnyei & Ushioda, 2011, p. 87) and provided "solid confirmation" (Dörnyei, 2009, p. 31) and that "the emerging picture consistently supports [its] validity" (Dörnyei, 2014, p. 521), this research has relied almost exclusively on one criterion measure, namely (self-reported) intended effort; "thus," as Robert Gardner concluded in his critique of the L2 MSS, "they relate one measure based on verbal

report to another measure based on verbal report" (Gardner, 2010, p. 73). Research testing the ideal L2 self in the context of actual L2 achievement has been less conclusive. Still, unlike in the case of the ought-to L2 self, these results should not be seen as detracting from the potential of ideal selves. Instead, it is more likely that the conventional method of elicitation (i.e., "I can imagine myself . . .") does not do justice to the perceived desirability, accessibility, plausibility, and present–future discrepancy that the theory stipulates as conditions (cf. Henry & Cliffordson, 2015; Hessel, 2015). Expecting "I can imagine myself" to subsume all these complex facets is too optimistic.

#### 7.4. Intended effort

This scale and its variations (e.g., motivated behavior) have been the primary source of validation for the ideal L2 self. However, little attention has been paid to the validity of this scale in the first place. In this study, as in others reviewed earlier, intended effort has emerged as a poor predictor of actual achievement. One possible reason for this is that self-report rating, by nature, is a crude estimate that is incapable of eliciting precise responses. This explanation is reminiscent of an early study by McClelland and Atkinson (1948), who compared the self-reported hunger of participants who had abstained from eating for one hour, four hours, or 16 hours. Although the last condition would certainly lead to the most hunger, the researchers found that self-reported hunger could not distinguish it from the four-hour condition (though their implicit test did), and thus self-ratings provided "a less sensitive index" (McClelland, 1987, p. 188). It seems that standard self-report measures are unable to capture subtleties beyond a certain threshold (e.g., learners with high vs. very high intended effort). More recently, Zogmaister, Perugini, and Richetin (2015) obtained similar results for both hunger and thirst using the IAT, with implicit scores showing more sensitivity to motivational states, while other studies showed a similar effect in relation to smoking (Sherman, Rose, Koch, Presson, & Chassin, 2003) and unfinished goal pursuit (Ferguson & Bargh, 2004). In reviewing research that has compared self-reports with objective measures of actual behavior, Back and Vazire (2012) report low to moderate correlations and conclude that "there are substantial blind spots in personality self-views when it comes to predicting actual behavior" (pp. 138-139).

Another possible reason for the poor predictive validity of intended effort is simpler. Common sense suggests that intended effort *should not* function as a consistent and reliable predictor of achievement. Some learners might express lower levels of intended effort *because* they believe they would obtain higher grades (e.g., confidence in one's ability to pass the test of a particular course). On the other hand, some low achievers might express higher intended effort

*because* they realize they are in danger of failing, thus trying to do too much too late. The dynamics of academic achievement thus seem very different from the dynamics of general L2 proficiency, and in some circumstances it seems naive to expect a straightforward link between intended effort and academic achievement (see Gardner, 2007; Moskovsky et al., 2016, for similar views). In the present study, intended effort had virtually no correlation with grades ( $r = .00$ ; see Table 2).

Finally, intended effort also showed a high level of susceptibility to social desirability. Self-report measures vary in the extent to which they are susceptible to social desirability (D. Chan, 2009), and intended effort turned out to be the worst of the bunch, just as Gardner and Glikzman (1982) reported earlier. Adding a control like social desirability to the statistical model serves to increase the efficiency of the estimate (Rutherford, 2000, p. 105) by reducing standard errors without a substantial change in effect size. While this procedure was effective in the case of Religious Attitudes (Table 6), it did not help intended effort. This adds to its problematic nature. It is therefore recommended that researchers exercise extreme caution in using intended effort as a criterion measure.

### 7.5. L2 learning experience

Although attitudes toward the learning situation are a robust predictor of L2 achievement as well as being one of the most dynamic constructs in L2 motivation (e.g., Lamb, 2012; MacIntyre & Serroul, 2015), it is unfortunate that this is probably the least theorized aspect in L2 motivation theory. This study also operationalized this construct using a semantic differential scale in order to make it parallel to implicit test. The merits of using Likert versus semantic differential scales have not received serious attention in the field.

That the effect of the L2 learning experience was not mediated by intended effort leads to the speculation that more “unintended” mediators might be playing a role, such as increased cognitive attention during enjoyable learning lessons. Such unintended motivated behavior triggered by particular situational cues may be too subtle to be detectable and self-reportable (Bargh, Gollwitzer, & Oettingen, 2010, p. 288). From this perspective, a variety of antecedents of successful learning can be investigated in future L2 research, such as the mere presence of motivationally-charged stimuli in the environment that are not even “noticed” by learners. For example, Radel, Sarrazin, Jehu, and Pelletier (2013) exposed their participants to a “barely audible” conversation (i.e., just above the auditory threshold) to which the participants could not have attended because they were engaged in a cognitively demanding task. When this conversation was about an intrinsically motivating activity reflecting enjoyment and satisfaction, the participants’ motivation was automatically activated so

that they consistently outperformed their control counterparts both in solvable tasks and in perseverance in unsolvable ones. The authors argue that studies successfully eliciting unconscious motivation through situational cues have yielded “indisputable evidence” (Radel et al., 2013, p. 763). It might also be a fruitful future direction to examine the malleability of implicit attitudes through the L2 learning experience (e.g., Dasgupta & Greenwald, 2001; Gregg, Seibt, & Banaji, 2006) and its effect on explicit motivation and successful learning. For example, Blair, Ma, and Lenton (2001) have demonstrated that engaging in mental imagery can counteract the effect of negative implicit attitudes.

### 7.6. Family support

This study showed that family support was a negative predictor of L2 achievement (for similar results, see Lamb, 2012, Table 9). This counterintuitive pattern is most likely because some parents recognize their children’s low achievement and then offer them extra support. Thus, this explanation reverses the direction of causality. Further interesting insights emerged from the correlational patterns of family support with the other variables. First, low achievers had stronger correlations between family support and each of the ideal L2 self and the L2 learning experience. That high achievers did not exhibit this pattern suggests that they had dissociated these two factors from parental influence. They for example enjoyed learning regardless of whether their parents proactively encouraged them to learn or not. Second, high achievers had a stronger correlation between family support and implicit attitudes toward L2 speakers. This pattern may support the distinction between the active and passive roles of parents, as “it is the parents’ passive role that may be the more effective one in the language learning context” (Gardner, 1985, p. 119). Investigating family support is not standard in current L2 motivation research, and therefore further research is required to shed more light on these exploratory results.

A limitation of the design of this study is that the direction of causality cannot be determined unequivocally. The use of *effect* and *predict* throughout this paper has been intended in the statistical sense only. It is possible, for example, that L2 success actually promotes favorable implicit attitudes. It is also possible that there is a reciprocal relationship between these two variables. It is hoped that this paper would inspire further research into these possibilities.

### 8. Conclusion

This study has shown that implicit attitudes toward L2 speakers and the L2 learning experience are positive predictors of L2 achievement, though neither of

them has received sufficient theoretical attention. This study has also shown that the ought-to L2 self and attachment to L1 group are negative predictors of L2 achievement. The ideal L2 self and intended effort showed no association with it.

While the “self” has served as a useful metaphor in L2 motivation for around a decade and has advanced the field beyond integrativeness, “the multitude of overlapping concepts in the literature on the self is more confusing than integrativeness ever could be” (MacIntyre, Mackinnon, & Clément, 2009, p. 54). This may not be undesirable. The complexity of the self may open up countless possibilities for future research on a multitude of aspects, conscious and unconscious.

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Appendix

Implicit test stimuli

L2 Speakers ST-IAT stimuli:

*Pleasant*: kind, beautiful, honest, optimistic, fair, knowledgeable, hardworking, polite, cheerful, clean<sup>a</sup>.

*Unpleasant*: mean, ugly, dishonest, pessimistic, unfair, ignorant, lazy, impolite, cheerless, dirty<sup>a</sup>.

*L2 Speakers*: George, Elizabeth, New York, Britain, Newton, Robin Hood, Shakespeare, Oxford University, dollar, BBC.

L2 Course ST-IAT stimuli:

*Pleasant*: interesting, clear, valuable, important, varied<sup>a</sup>, satisfying, good<sup>a</sup>, appealing, encouraging, clean<sup>a</sup>.

*Unpleasant*: boring, complicated, time-wasting, trivial, monotonous<sup>a</sup>, dissatisfying, bad<sup>a</sup>, repellent, discouraging, dirty<sup>a</sup>.

*L2 Course*: grammar, vocabulary, listening, reading, speaking, writing, learning, studying, lecture, teacher.

<sup>a</sup> Not included in the semantic differential scale.