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L2 motivation profiling and the role of context: A study in exploratory statistical procedures

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ABSTRACT

Two studies were carried out in order to create distinct motivational profiles of students, examine the way in which context had an effect on motivational styles, and attempt to collaborate these findings with the L2 Motivational Self-System. The research questions for this study were concerned with ascertaining whether or not it is possible to identify distinct learner types in terms of their motivational profiles; and to what extent different aspects of motivation contribute towards distinguishing different motivational profiles. The participants for the first study were 42 Dutch university students of English; and the participants for the second study were 26 adult learners of English at a language school in Sydney, Australia. In order to construct the motivational profiles, several exploratory statistical procedures were carried out, including principal components analysis and cluster analysis. The results found that the strength of the factors extracted in the principal components stage differed depending on the context of each study. In addition, the motivational profiles that were formed during the cluster analyses revealed distinct subgroups of learners which displayed varying levels of homogeneous characteristics.

Keywords: motivation; context; motivational self-system; L2 learning

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Introduction

The concept of motivation as one of the most influential individual differences associated with successful mastery of a second language has long been a primary focus of the field of applied linguistics. However, unlike many individual differences which can be quantifiably measured on an accurate scale (e.g. age or length of time learning the language), there is much debate in the literature as to what exactly motivation is comprised of and what effect it has on outcomes and proficiency in learning a second language (L2). In addition, traditional research designs have failed to incorporate L2 motivation research into the wider field of linguistic research, as the former's research designs are often product rather than process related. In an attempt to correct this, Dörnyei (2005) proposed a model he named the L2 Motivational Self-System, which focused on the idea of 'possible selves', as well as stressing the importance of context to the language learning experience. It has been argued (Skehan, 1991) that within larger bodies of language learners, there are smaller sub-groups of learners which naturally group together as a result of demonstrating particular motivational patterns. Investigating these groups not only allows researchers to explore the complex interactions of variables which are thought to relate to motivation, but also contributes to the study of effective language teaching within a classroom (Alexander & Murphy, 1999).

A study conducted by Csizér and Dörnyei (2005) used cluster analysis as a means of investigating intra-individual differences across a variety of measures relating to motivation. The study constructed motivational profiles of students and then applied them to the L2 Motivational Self-System. This research design therefore demonstrated a possible initial step for a larger study that would exhibit a process rather than product-related design and acted as the impetus for the current study.

This paper is concerned with four research questions:

1. Is it possible to identify distinct learner types in terms of their motivational profiles?
2. How do the different aspects of motivation contribute towards distinguishing different motivational profiles?
3. To what extent does context (i.e. the environment in which the language is learned) affect the construction of motivational profiles?
4. What conclusions can we draw from the construction of motivational profiles and what pedagogical implications will these conclusions have?

In this study, a review is given of the most influential theories of L2 motivation, with a focus placed on Dörnyei's conceptualisation of the L2 Motivational Self-System (2005). This model of L2 motivation was then applied to the current study. Data was gathered from 42 Dutch university students of English and, using exploratory statistical procedures including principal components analysis and cluster analysis, motivational profiles of these students were created in an attempt to identify homogeneous subgroups amongst the population. This study was then replicated on 26 learners of English at a language school in Sydney, Australia.

Background

Conceptualising motivation

The Socio-Educational Model (Gardner, 1985) has been one of the most influential models of second language acquisition (SLA) and dominated the field in the second half of the twentieth century. The model was primarily concerned with the role individual differences play in SLA. The core finding made by the socio-educational model when it was investigated using causal modelling is that the factor that is most linked to second language proficiency and success is motivation, with attitudes towards the learning situation and integrativeness acting as supporting factors of motivation (Gardner, 1985). In addition, the model allows for motivation in an individual learner to be influenced by numerous other variables, including integrative and instrumental orientations. An integrative orientation could include wishing to participate in the activities of a different cultural group or making more friends amongst people from that group. In contrast, a learner who has an instrumental orientation wishes to learn a particular language because of the pragmatic benefits associated with the language. This could include the promise of a better job or an increased ability to compete with others (Gardner & Lambert, 1972).

In addition to Gardner's work, research into the effect that self-confidence and anxiety have on one's motivation to learn a second language have gradually been incorporated into research on motivation. When looking at self-confidence, Richard Clément's research that focused on the Canadian context and the relationship between the Anglophone and Francophone communities has proven influential. He argued that linguistic self-confidence becomes a natural determiner for motivation to learn a second language when two language communities can be found in the same place (Clément & Kruidenier, 1985) and many studies have reported significant correlations between indices of self-confidence and L2 proficiency (e.g. Clément, Dörnyei & Noels, 1994; Gardner, Tremblay & Masgoret, 1997). When looking at anxiety, several studies have found that as proficiency increases, anxiety decreases, and that there is a negative correlation between these two factors (Bernaus & Gardner, 2008; Clément, Dörnyei & Noels, 1994). However, several studies have found the opposite. Kleinmann (1977), for example, found that students who performed more proficiently when required to use difficult linguistic structures reported higher levels of anxiety than those students who did not perform as proficiently. It is possible that correlations between anxiety and performance are dependent upon variables, including, but not limited to, context. It is also possible that anxiety can have a facilitating effect when the gaps between the students' perceived level of proficiency and their desired level of proficiency are seen as possible to navigate, i.e. the learners feel that closing such a gap is feasible. When a student does not believe that bridging this gap is possible, anxiety begins to have a debilitating effect. Tremblay and Gardner (1995, p.507) suggest that: "The higher the expectancy that a behaviour can produce a specific outcome, the greater tends to be the motivation to perform the activity."

Gardner's instrumental and integrative orientations as well as measures of self-confidence and anxiety have been widely used in the study of L2 motivation since the initial publication of Gardner's model (1985). It has been argued (Jacques, 2001) that one of the principal reasons that Gardner's model has been so influential is that he also aided in the creation around this time of the Attitudes and Motivation Test Battery (AMTB), (Gardner & Smythe, 1981). The AMTB has been widely implemented in the field of L2 motivational research (e.g. Gardner, Tremblay & Masgoret, 1997).

Despite empirical evidence suggesting that all of the variables discussed above correlate in some way with achievement in a second language, the field of motivation research came under critical scrutiny at the beginning of the 1990s. Crookes and Schmidt (1991) argued that the social psychological theories, and in particular, Gardner's (1985) socio-educational model, had

dominated the field thoroughly yet only examined limited paradigms, such as integrative and instrumental orientation. Drawing on both Attribution Theory (Weiner, 1972) and Self-Determination Theory (Deci & Ryan, 1985), Dörnyei conceptualised what he termed the L2 Motivational Self-System (2005). This theory draws on the idea of *possible selves*, a concept first introduced by Markus and Nurius (1986). Dörnyei states: “I believe that possible selves offer the most powerful, and at the same time the most versatile, motivation self-mechanism, representing the individual’s ideas of what they *might* become, what they *would like* to become, and what they are *afraid* of becoming.” (2005, p. 98). Dörnyei (2005) is primarily concerned with two types of possible selves- the ideal self and the ought-to self (Higgins, 1987).

Motivation research designs

Despite the relatively robust theories surrounding the role that individual differences such as motivation, attitudes, self-confidence, anxiety, and perceived proficiency play in successful L2 acquisition, motivation research has yet to be fully integrated into the broader field of SLA research. Dörnyei (2003) argues that this is because motivation research designs have traditionally been from a macro perspective, conducted by social psychologists, whereas SLA research focuses on analysing the development of an L2 from a micro perspective, and is most often conducted by linguists. Therefore, whilst various theories or models regarding different orientations, individual differences, and possible selves provoke thoughtful contemplation, the traditional research designs which often accompanied such paradigms were product-oriented (concerned with investigating the relationship between learner characteristics and language outcomes), whereas SLA research designs are most often process-oriented (Dörnyei, 2003).

Researchers interested in aligning the field of L2 motivation research to mainstream SLA research thus began, in the 1990s, to adopt a process-oriented approach to motivational research (Dörnyei, 2005). In order to do this, motivational research designs must begin to take into account the specific learning *behaviours* which must take place in order for language learning *achievement* to occur. In line with this, Skehan (1991) proposed that learner strategies and learner styles mediated the influence of affective variables (such as motivation) and cognitive variables (such as intelligence) in order to produce outcomes. Currently, it is more common to test variables relating to motivation or attitudes and then compare these to measures of achievement or proficiency, without acknowledging that there must be a process in between these two measures (e.g. Gardner, Day & MacIntyre, 1992).

This process-oriented approach has also aided in the operationalization of motivation as a situated construct, rather than a latent, cognitive system independent of agent or context. Dörnyei (2009) argues that individual differences (such as motivation) can never be measured accurately unless the characteristics of a particular environment are also taken into account, as they are inseparable.

Statement of purpose

The problem, therefore, becomes one of operationalization- how do we investigate the way in which affective variables interact to produce specific learning behaviours, whilst keeping the influential nature of context in mind? The answer may be the most discriminating individual difference of all- personality. Behaviour can often be predicted by personality type, as evidenced by the widespread use of the Myers-Briggs Type Indicator, which is often used by companies when interviewing new employees in an attempt to hire promising or compatible personality types. The test was first developed in the earlier half of the 20th century (Myers, 1962) and has seen numerous incarnations, although the basic principles remain the same- it aims to show that personality has a significant impact on achievement (irrespective of aptitude) because it is

personality that decides which behaviours will occur. Skehan (1991) hypothesized that researchers are likely to find differing types of L2 learners amongst student populations- a hypothesis which has found support in other studies (e.g. Moody, 1988).

The current study aimed, therefore, to create motivational profiles of students as an initial stage in a process-oriented approach to motivational research. In a process-oriented approach, the ultimate goal would be to create motivational profiles and then examine which specific learning behavior students within those profiles exhibit. Examining these behaviours in light of language learning outcomes would provide valuable insight into the causal effect motivation has on behaviour and behaviour has on learning outcomes. Taking inspiration from a study conducted by Csizér and Dörnyei (2005), the current study used cluster analysis as a means of investigating intra-individual differences across a variety of measures. Cluster analysis is a relatively uncommon procedure used in SLA research, although many studies which have implemented the procedure have been able to successfully apply a pre-nominated theoretical framework (e.g. the L2 Motivational Self-System) to the resultant clusters (e.g. Csizér & Dörnyei, 2002; Csizér & Dörnyei, 2005; Hiromori, 2009; Kojic-Sabo & Lightbown, 1999; Koul, Roy, Kaewkuekool & Ploisawaschai, 2009; Skehan, 1986; Yamamori, Isoda, Hiromori & Oxford, 2003; Yashima & Zenuk-Nishide, 2008). One of the benefits of cluster analysis is that it allows researchers to investigate the ways in which different manifestations of motivation affect a student's subsequent behaviour in the language learning context. An example of the use of motivational profiles formed through cluster analysis can be seen in a study by Tagashira, Yamato and Isoda (2011) who used these profiles to investigate the effect they had on the pragmatic awareness of students in the classroom.

The current study defined and described distinct motivational profiles amongst two disparate groups of language learners using cluster analysis and other exploratory statistical procedures. The purpose of creating these motivational profiles was to investigate the way in which different variables commonly explored in L2 motivation research combine to form clusters and the way in which the L2 learning environment (or context) affects the strength of these variables. The results of these findings are then explored in light of Dörnyei's model of the L2 Motivational Self-System (2005).

Study one: Method

Participants

The sample was comprised of 42 Dutch university students who were all enrolled in the Bachelor of English Studies at the Rijksuniversiteit Groningen in the Netherlands. There were 17 first year, 15 second year and 10 third year students, including 11 males and 31 females.

Materials

Participants were sent a link to an online questionnaire and asked to complete it. Measures were gathered on 11 variables. The first variable concerned the self-perceived proficiency of each student and was measured on a 4-point scale ranging from "Poor" to "Excellent".

Self-perceived proficiency. (SPP; $\alpha = .89$).

This measure consisted of two items, with a high score indicating a very high self-perceived proficiency.

The other 10 variables were assessed using a 4-point Likert scale ranging from “Strong Disagreement” to “Strong Agreement” and were adapted from the AMTB (Gardner & Smythe, 1981). The full set of questions can be found in the appendix. The reliability (Cronbach’s alpha) of each variable is listed in brackets.

Integrativeness was defined as the willingness and aspiration of the student to adopt characteristics of the target language’s culture and was measured using three different variables.

Attitudes towards native English speakers. (ANE; $\alpha = .548$).

This measure consisted of two positively worded items and two negatively worded items. A high score indicates a highly favourable attitude towards native English speakers.

Interest in foreign languages. (IFL; $\alpha = .718$).

This measure consisted of two positively worded items and two negatively worded items. A high score indicates a high level of interest in any L2.

Integrative orientation. (ITO; $\alpha = .755$).

This measure consisted of four positively worded items. A high score indicates a strong desire to learn English for integrative reasons.

Motivation is a grouping of variables concerned with the students’ motivational intensity to learn the language and was measured using three different variables.

Attitudes towards learning English. (ALE; $\alpha = .360$).

This measure consisted of two positively worded items and two negatively worded items. A high score indicates a positive attitude towards learning English.

Desire to learn English. (DLE; $\alpha = .397$).

This measure consisted of two positively worded items and two negatively worded items. A high score indicates a strong desire to learn English.

Motivational intensity. (MOI; $\alpha = .449$).

This measure consisted of two positively worded items and two negatively worded items. A high score indicates a significant amount of applied effort from the student.

Additional orientations. Whilst there are several other orientations to do with motivation that have been investigated in previous studies, for the purpose of this study the only additional orientation that was dealt with was an instrumental orientation, due to restrictions on the number of questions we were able to use for the study.

Instrumental orientation. (*ISO*; $\alpha = .726$).

This measure consisted of four positively worded items. A high score indicates a strong desire to learn English for pragmatic/instrumental reasons.

Anxiety was measured using two variables.

English class anxiety. (*ECA*; $\alpha = .711$).

This measure consisted of one positively worded item and two negatively worded items. A high score indicates a low level of anxiety experienced in class.

English use anxiety. (*EUA*; $\alpha = .791$).

This measure consisted of two positively worded items and two negatively worded items. A high score indicates a low level of anxiety experienced when using English.

In addition, measures of **self-confidence** were adapted from Clément & Kruidenier (1985).

Self-confidence (*SCO*; $\alpha = .809$) was measured using five positively worded items. A high score indicates a high level of self-confidence.

Design and analyses

In this study, we were not specifically concerned with developing and testing hypotheses. Instead, we approached the four research questions outlined in the introduction in an explorative manner. We were particularly interested in exploring whether or not there was evidence of ideal or ought-to selves within the clusters which emerged, as a follow-on from Csizér and Dörnyei's (2005) study where evidence of this model was found in the clusters they formed. In addition, due to the work of past researchers who have found a significant effect of context on the ways in which various cognitive or affective variables influence learners (Kojic-Sabo & Lightbown, 1999; Oxford & Shearin, 1994), we explored the effect that the language learning environment (the context in which the language is learned) had on the structure of motivational profiles amongst language learners.

This study was primarily concerned with motivation and therefore measures of specific learner strategies or behaviours were not taken in this study. However, in light of previous studies (e.g. Tagashira, Yamato & Isoda, 2011), we suggest that the construction of motivational profiles may act as an initial step in a process-oriented approach which aims to investigate not only the motivation of language learners, but the subsequent language learning behaviours and language skills which develop in these learners.

Principal components analysis

Principal components analysis was conducted in order to investigate the way in which the different variables interacted with each other in different groups of learners. We wanted to explore whether or not variables within one context (e.g. a Dutch foreign language environment) would correlate differently if they were measured in a different context (e.g. an Australian, second language environment).

After the data was collected from the participants, it was entered into the SPSS 20 programme. A principal component analysis (PCA) was conducted to identify latent, essentially uncorrelated variables within the data. This form of analysis has been widely implemented in linguistic research (e.g. Belmechri & Hummel, 1998; Clément, Dörnyei & Noels, 1994; Warden & Lin, 2000). PCA is primarily used for very large-scale designs (e.g. Inbar, Donitsa-Schmidt & Shohamy, 2000; Schmidt & Watanabe, 2001) although it is possible to use it for smaller data sets providing these meet certain requirements (i.e. the Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity). As it does not require longitudinal data, PCA was chosen as the most applicable tool for this particular study. Other studies which have used cluster analysis to define different learner profiles have also made use of PCA as an initial procedure (e.g. Csizér & Dörnyei, 2005; Morris, 2001).

Cluster analysis

Cluster analysis identifies participants who have similar characteristics and then creates homogeneous subgroups amongst the large population. If all participants behaved in completely unique manners, there would be an equal number of clusters to participants. Conversely, if participants acted in exactly the same way, there would only be one cluster. Using cluster analysis allows researchers to cluster participants meaningfully, whilst still recognising that each subject will, at some level of the clustering process, behave in a way that is completely unique. Traditionally, cluster analysis is performed as a two-step procedure, first with a hierarchical analysis and then a K-means analysis. The hierarchical analysis produces dendrograms which help the researcher determine the optimum number of clusters. Once the optimum number of clusters has been decided, a K-means analysis is run which allocates participants to the predefined number of clusters. As cluster analysis is an exploratory statistical procedure, it is important to validate it in terms of a sound theoretical construct and use subsequent procedures to substantiate the results (Csizér & Dörnyei, 2005). Throughout this study, the resulting clusters were analysed in an attempt to apply them to Dörnyei's L2 Motivational Self-System. One method of substantiating the results from cluster analysis is to compare the results with an external criterion measure (Alexander & Murphy, 1999). However, with the absence of such a measure in this study, an alternative approach was sought. Kojic-Sabo and Lightbown (1999) argue that there is no way to determine what the optimal number of clusters is, and in fact, whether or not subjects have been organized into the cluster that best fits their individual profile. However, in this paper it is argued that using a MANOVA and subsequent discriminant function analysis (DFA) enables a researcher to ascertain (to a high degree of accuracy) whether or not the original clustering process has been effective, as the nominal independent variable cluster membership is calculated from the 11 variables originally used in the cluster analysis- thus substantiating any results found in the latter.

MANOVA and Discriminant Function Analysis

A MANOVA was run to test whether there was a significant effect of cluster membership on the variables. The MANOVA was followed up with a discriminant function analysis in order to investigate the relationship between the variables and compare this relationship to the factors extracted in the PCA. The purpose of this analysis was twofold. The first purpose was to identify how many factors were responsible for significantly discriminating between the clusters and the second was to confirm that the cluster analysis procedure had accurately separated the subjects into the most fitting cluster.

The loadings that appear in discriminant function analysis are comparative to factor loadings in a principal components analysis, in that they specify the strength of each of the functions. However, it must be stressed that a discriminatory function analysis does not produce the same factors that a principal component analysis does. Instead, it serves as a predictor of subject membership to clusters that already exist by identifying underlying functions that serve to discriminate the clusters from each other (Field, 2009).

Once the clusters had been classified correctly they were subjected to one-way ANOVAs to ascertain the effect of cluster membership on the 11 individual variables. The clusters were then described in terms of their most dominant characteristics. The decision level for all analyses conducted in this study was set at $< .05$, which is the industry norm.

Study one: Results

Principal components analysis

A principal component analysis was run on the 11 variables with orthogonal rotation (varimax). However, upon first running the analysis it became apparent that three of the variables did not correlate highly enough with any of the other factors (IFL, ANE and ISO) and were thus excluded from the analysis (the correlation coefficient tables can be found in Appendix C). The analysis was run again. The Kaiser-Meyer-Olkin (KMO) measure confirmed that the sample size was adequate for the analysis (KMO = .75). According to Field (2009), the KMO measure should be higher than .5 in order for PCA to be appropriate. Bartlett's test of sphericity ($\chi^2 (28) = 127.95, p < .001$) signifies that the correlations between the variables are sufficiently strong enough to conduct principal component analysis. Eigen values were obtained for all factors and only those with a value higher than 1 were retained (as specified by Kaiser, 1974). Two components were found to have Eigen values over 1 and these collectively described 65.55% of the variance found in the data, which is substantial. Examination of the scree plot (Cattell, 1966) confirmed that a two factor solution was appropriate. After the varimax rotation the manner in which the variables are loaded suggests that the factors represent two distinct subscales: Factor I contains all variables relating to self-confidence; and Factor II represents the overall language learning motivation of the student. The loadings in Table 1 are only present above the value of .4, as this is the cut-off point that Stevens (2002) suggests.

After conducting a reliability analysis on the two subscales of the questionnaire, they were found to have sufficiently high reliabilities (Factor I $\alpha = .873$; Factor II $\alpha = .736$).

Table 1
Summary of Principal Component Analysis Results for Dutch Data (N=42)

Variables	Factors	
	Factor 1	Factor 2
SCO	.932	
ECA	.860	
EUA	.828	
SPP	.814	
MOI		.772
ITO		.749
DLE		.732
ALE		.731
Eigen values	2.983	2.26
% of variance	37.291	28.255
Cronbach's α	.873	.736

Note. The rotation method was varimax with Kaiser normalisation. The Eigen values and % of variance are taken from after the varimax rotation.

Cluster analysis

The cluster analysis was conducted in two stages, using all 11 variables as grouping variables. Firstly, a hierarchical cluster analysis using Ward's method and the squared Euclidean distance as the interval measure was run. Upon analysis of the dendrograms (found in Appendix B), the decision was made to continue with the assumption that the data could be separated into three clusters. A subsequent K-means analysis was run to ensure the between-cluster distance was as distinct as possible and the within-cluster distance was as homogeneous as possible.

MANOVA

Using Pillai's trace there was a significant effect of cluster membership on the 11 variables, $V = 1.3$, $F(22,60) = 5.152$, $p < .01$. In addition, separate univariate ANOVAs revealed significant cluster effects on all variables except IFL and ANE.

Discriminant function analysis

This analysis revealed two discriminant functions. The first explained 69.7% of the variance; and the second explained 30.3%. Both discriminant functions found in the analysis significantly differentiated the three cluster groups, together ($\Lambda = .11$, $\chi^2(22) = 74.67$, $p < .01$) as well as individually ($\Lambda = .44$, $\chi^2(10) = 28.01$, $p < .01$). The classification results from the discriminant function analysis revealed that 97.6% of the subjects from the original cluster analysis had been clustered effectively. Only one subject was labelled as being clustered incorrectly. This subject was moved from cluster 2 to cluster 1 for the subsequent analyses.

Within cluster analyses

One-way ANOVAs were then conducted in order to ascertain what effect cluster membership had on the individual variables. There were significant effects of cluster membership on the

variables SPP, ALE, DLE, ECA, EUA, ITO, MOI, and SCO. Subsequent Post-Hoc analyses revealed that there was most often a significant difference between the lowest scoring group and the higher groups, but no significant differences were found between the two highest groups. Details of all one-way ANOVAs and Post-hoc analyses can be found in Appendix E.

Study one: Discussion

Principal components analysis

When looking at the factors which were uncovered in the PCA, it becomes apparent that the results are comparable to those from previous studies. Factor I has high loadings from the self-confidence, English use anxiety, English class anxiety, and self-perceived proficiency variables. Whilst this is contrary to Gardner's (1985) socio-educational model, which relates English class anxiety to the learning environment rather than to self-confidence; more recent studies would argue differently (e.g. Clément, 1986; Clément, Dörnyei & Noels, 1994; Clément, Gardner & Smythe, 1980; Gardner & MacIntyre, 1993a; Gardner, Tremblay & Masgoret, 1997).

The second factor revealed by the principal components analysis (the 'motivation' factor) contained the variables ALE, DLE, MOI, and ITO. The AMTB (Gardner, 1985) groups the first three of these variables together into one category termed 'motivation', which would validate the strong correlations between these variables. It is also understandable that ITO loads strongly onto this factor, given that those participants who have strong, positive feelings for a language community are more likely to demonstrate higher motivation to learn that language. This does not mean that one directly influences the other, but that interaction over time between two variables such as these is likely to result in positive correlations.

Cluster analysis

Cluster 1 scored lowest on SPP, EUA, ECA, and SCO. It scored significantly higher than the lowest (but with no significant differences to the other cluster) on ALE, DLE, and MOI. Therefore, it is possible to describe Cluster 1 as having low levels of self-confidence and the highest levels of anxiety in English class (thereby scoring poorly on all variables that loaded onto Factor I). However, they scored significantly better than the lowest scoring group on three of the factors that load onto Factor II- the motivation factor. This would indicate that even though the subjects experience anxiety and have a low perception of their own proficiency, their attitude and desire towards learning English is strong enough to provide the impetus for the students to continue with their motivated efforts to learn the language. This links back to the idea that anxiety need not be debilitating or counter-productive to motivation as long as bridging the gap between the students' perceived current proficiency and their ideal proficiency is seen as attainable (Crookes & Schmidt, 1991; Shaaban & Ghaith, 2000).

Cluster 2 had the highest scores for ALE, DLE, ITO, and MOI, and scored significantly better than the lowest scoring cluster on SPP, ECA, EUA, and SCO. This cluster therefore can be categorised as having lower levels of anxiety and relatively higher levels of self-confidence, as well as strong motivation to learn the language. Whilst the purpose of this paper was not to determine which clusters are the most or least motivated, it would seem that this cluster embodies a fully-realised L2 ideal self, where both the pragmatic and affective reasons for learning an L2 have been embraced (Dörnyei, 2005).

Cluster 3 had the lowest scores for ITO, MOI, DLE, and ALE. However, this cluster did not score significantly better than the lowest scoring cluster on SPP, ECA, EUA, and SCO. This cluster can therefore be categorised as scoring highly on all variables from the factor 'self-confidence', but very poorly on the variables from Factor II, indicating a low level of esteem held for the target language. This cluster may therefore have separated their confidence in the English language from the language itself; and so what we see exhibited is that an integrative orientation or desire to learn the language has no bearing on the performance of the student. A similar finding was made by Csizér and Dörnyei (2005), in that one of their clusters exhibited a strong sense of the relevancy of learning an L2 but did not have positive feelings towards the L2 community. Csizér & Dörnyei suggest that this is because this particular cluster of subjects had not "... internalised their professional interest to the extent that it has developed into an ideal language self." (2005, p. 638). Instead, this group appear to embody Dörnyei's (2005) description of the 'ought-to' language self.

Study two: Method

Participants

The second study examined students from an English language school in Sydney, Australia. All students who participated in the study were in Australia on a student visa to learn English and all attended the morning classes offered by the school. It was important that the students examined did not attend the night classes offered by the school, as the majority of these students work during the day and attend classes at night to satisfy the conditions of their visa. As a result of this, their motivational levels tend to be much lower than those of the students in the morning classes. There were 26 students who filled in the research questionnaire. Of these 26, 8 were from the intermediate level, 13 were from the upper-intermediate level and 5 students were in the advanced level at the school. At this particular school, students are expected to complete each course level in approximately 12 weeks. There were 10 male and 16 female students. The ages of the students ranged from 17 to 45 years with an average age of 24.19 (SD = 6.3).

Materials

The students were given the same questionnaire as the Dutch students in the first study, with minor changes made to suit an international group of participants. The Cronbach's alpha values for the 11 variables can be found in Appendix A.

Study two: Results

Principal components analysis

The PCA with orthogonal rotation (varimax) revealed just one factor for the Australian data. The variable SPP was identified as problematic as it did not correlate sufficiently with the factor and it was thus eliminated. This factor described 49.2% of the variance. Whilst all remaining ten variables notably loaded onto the factor (with loadings above .4 as Stevens [2002] suggests), it can be seen from Table 2 that some factors loaded more strongly than others.

Table 2
Summary of Principal Component Analysis Results (N=26)

Variables	Factor I
ALE	.803
SCO	.802
DLE	.797
MOI	.794
ANE	.782
ITO	.675
IFL	.659
EUA	.609
ISO	.552
ECA	.437
Eigen value	4.922
% of variance	49.215
Cronbach's α	.875

Note. As there was only one factor extracted no rotation method was used.

Cluster analysis, MANOVA and discriminant function analysis

The cluster analysis was conducted in the same way as the first study and it revealed two clusters within the group.

A MANOVA was run to test the validity of the two clusters when measured against the variables. Using Pillai's trace there was a significant effect of cluster membership on the variables, $V = .85$, $F(11,14) = 7.202$, $p < .01$. In addition, separate univariate ANOVAs revealed significant cluster effects on all variables except SPP, ECA, and EUA.

The discriminant function analysis revealed one discriminant function which explained 100% of the variance; and also helped to validate the original PCA which suggested a single factor solution. It significantly differentiated the clustered groups, $\Lambda = .15$, $\chi^2(11) = 35.075$, $p < .01$. The classification results from the discriminant function analysis revealed that 100% of the subjects from the original cluster analysis had been clustered effectively.

Independent samples t-tests were then conducted in order to examine the variables within each cluster. For those variables where there was a significant effect of cluster membership (all but SPP, ECA, and EUA), Cluster 1 significantly outperformed Cluster 2 ($p < .05$). Details of all independent samples t-tests can be found in Appendix E.

Study two: Discussion

Principal components analysis

When looking at the factors that were extracted in the principal components analysis, immediate differences can be noted between the Australian and Dutch data. Whilst the Dutch PCA revealed two factors (a self-confidence factor and a motivation factor) the Australian data only revealed one factor which seemed to encompass most of the variables to differing degrees. The loadings of ITO and ISO in combination with MOI are noteworthy, as Masgoret and Gardner (2003) argue, a strong integrative or instrumental orientation does not necessarily equate with high levels of motivation. Further analysis of the correlation matrix (Appendix B) reveals that all variables demonstrated high correlations with most other variables within the factor, indicating that, for

this set of data, the factor exhibits a lack of differentiation amongst the participants in terms of how they view the language learning process.

Cluster analysis

Cluster 1 scores significantly higher than cluster 2 on all variables where a significant effect of cluster membership was found ($p < .05$). Cluster 1, therefore, can be seen as demonstrative of the fact that motivation and a positive attitude towards a language increase when the gap between the current state and the desired state (the ideal or ought-to self) is seen as bridgeable- regardless of current ability. It is hypothesized therefore that Cluster 2 is made up of participants whose motivation is affected by the fact that their self-confidence is too low and anxiety levels too high to have a positive attitude regarding this gap. This would indicate that this cluster has no developed concept of the ideal L2 self (Dörnyei, 2005). It is notable that the three variables where no significant effect was found (SPP, ECA, and EUA) all relate to 'performance' of the language. This can be related back to the idea that anxiety does not necessarily have to have a debilitating effect on language learning and performance (Tremblay& Gardner, 1995).

Discussion

Test-Score Validity

All of the test items for this study were taken from the AMTB and all had sufficiently high Cronbach's alpha values ($> .07$). However, upon testing the reliability of the test items on the particular data used in this study (for both the Dutch and Australian data) what emerges is that, for many of the items, particularly in the Australian data, the Cronbach's alpha values are low. This was not a huge cause for concern, as the alpha values for these variables in the AMTB are high and justified their usage in the study. However, there should be an explanation for why the alpha values for the individual variables are so low. Bernardi (1994) states that a sample which contains subjects from similar backgrounds will result in an increased similarity in the responses to test questions; therefore, particularly when looking at the Australian data where subjects came from numerous different countries and cultures, the reason for the low Cronbach's alpha values could be context. In addition, Bernardi argues that Cronbach's alpha should actually be interpreted as a very conservative test of reliability, considering that most of the time it measures the internal consistency of factorially complex variables.

Comparison of factors extracted in principal components analysis

The two different studies revealed markedly different patterns in the ways in which variables loaded onto factors in the PCAs. Whilst the Dutch data differentiated between variable relating to self-confidence and motivation, the Australian data showed more overlapping of variables, with one very general factor emerging. We suggest that one of the reasons for this is the differing contexts that the data was gathered from. The Dutch participants were all university students who had chosen to study English. Whilst a certain level of motivation must be assumed considering the participants had elected to be English majors, there was a great deal of variability surrounding all the variables. Conversely, the Australian participants were all in Australia on a student visa to learn English. To these students, learning English was not linked to an abstract instrumental or integrative orientation, or a possible self, but rather to the very concrete possibility that they had the opportunity to remain in Australia if they were successful in learning English, and that they would be deported if they did not show improvement with their English skills every month. Therefore, their answers did not differ as distinctly between the variables as

the Dutch students' did, possibly because they have a very great need to learn English which influenced all other factors.

In addition, distinct from the personal context of the students is the context of the learning environment or culture. Several studies have found that whether the L2 is being learnt in a second or foreign context can determine the influence of both cognitive and affective variables in individual learners (e.g. Oxford & Shearin, 1994; Kojic-Sabo & Lightbown, 1999). However, a mere distinction between a second and foreign language culture is most probably insufficient to determine the influence of context on the manifestation of different motivational profiles. For example, Warden and Lin (2000) found that one of the most influential factors affecting the level of motivation in a group of 442 non-English major students at Chaoyang University of Technology in Taiwan was requirement. That is, if a subject was a requirement of the students, then their motivation was found to increase. This is obviously neither an integrative nor instrumental orientation, but an orientation not fully explored in the West.

Clusters and the L2 motivational self-system

Context also had an effect on the way in which Dörnyei's (2005) proposal of the L2 Motivational Self-System manifested itself. In the Dutch data what appeared were three relatively distinct groups who exhibited different possible selves, ranging from a group that had not begun to develop an ideal self at all to students with fully-fledged ideal selves. However, in the Australian data there was one cluster which had a more developed sense of the ideal self and one that showed virtually no sign of such a concept.

What emerges from both sets of clusters is that whilst signs of both the ought-to and ideal-selves can be seen in the Dutch data, no such distinction is discernible in the Australian data. This again ties in with the discussion of the differences in the factors which were found- the Australian students may have a driving need to learn English which has already internalised all aspects of Dörnyei's (2005) model of the L2 Motivational Self-System, thereby making it less clear which types of possible selves they have begun to identify.

Conclusion

Yamamori et al (2003) argue that teachers will become more efficacious educators, the better they understand their students, yet investigating the individual cognitive and affective variables of every student and their subsequent learning behaviours would be an extremely time consuming process. In addition, even if such investigations were to be carried out, teaching each student individually in a manner suited to their motivational or learning style profile would be logistically impossible. When also taking into account the dynamic nature of one's motivation, it could also be argued that such analyses would be useless longitudinally, as each student's motivation will change over time. Therefore, cluster analysis is perhaps best utilized as a procedure in research designs which precedes investigation of language learning behaviours and subsequent language learning outcomes. Information on which learning behaviours are utilized by successful language learners will enable teachers to effectively coach less motivated students and create a pedagogical environment that is conducive to inspiring rather than dampening motivation.

A typical research design for a motivation study would entail correlational analyses between measures of motivation and measures of aptitude or performance on L2 tests. However, Dörnyei (2003) argues that motivation research must move away from such traditional designs and instead focuses on investigating the effect motivation has in creating or influencing certain language

learning *behaviours*. Future research concerning the field of motivation should focus on exploring a three-step link between motivation, language learning behaviour and subsequent language learning outcomes or proficiency. In this paper, we have argued that cluster analysis is a valid means of performing this first step- identifying differing levels of motivation amongst students and attempting to note similar characteristics which may then go on to influence the language learning behaviours students are likely to exhibit.

In identifying differing levels of motivation amongst students, researchers may then begin to examine the ways in which teaching strategies and the classroom context have an effect on the different aspects of motivation and therefore on the subsequent learning behaviours students exhibit as a result of their motivational profile.

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Appendix A: Attitude/Motivation Test Battery Items

These items were adopted from the AMTB (Gardner, 1985).

Attitudes towards native English speakers (*Study I a = .548; Study II a = .025*)

Positively keyed

- Most native English speakers are so friendly and easy to get along with that the Netherlands is fortunate to have them.
- Native English speakers are very sociable, warm-hearted and creative people.

Negatively keyed

- The more I learn about native English speakers, the less I like them.
- The spread of English in the Netherlands is having a negative effect on the Dutch culture.

Attitudes towards learning English (*Study I a = .360; Study II a = .606*)

Positively keyed

- I plan to learn as much English as possible.
- I really enjoy studying English literature.
- I really enjoy learning the English language.

Negatively keyed

- Learning English is a waste of time.

Desire to learn English (*Study I a = .397; Study II a = .531*)

Positively keyed

- I wish I had begun studying English at an early age.
- The English language is really great.

Negatively keyed

- I sometimes daydream about not studying English anymore.
- I find I'm losing any desire I ever had to learn English.

English class anxiety (*Study I a = .711; Study II a = .237*)

Positively keyed

- It worries me that other students in my class seem to speak English better than I do.
- I am sometimes afraid the other students in my English class will laugh at me when I speak English.

Negatively keyed

- I don't usually get anxious when I have to respond to a question in my English class.

English use anxiety (*Study I a = .791; Study II a = .147*)

Positively keyed

- I would feel comfortable speaking English in an informal gathering where both English and Dutch speaking persons are present.
- I would feel quite relaxed if I had to ask street directions in English.

Negatively keyed

- It would bother me if I had to speak English on the telephone.
- I would get nervous if I had to speak English to someone in a store.

Interest in foreign languages (*Study I a = .718; Study II a = .764*)

Positively keyed

- I would really like to learn many foreign languages.
- I enjoy meeting and listening to people who speak other languages.

Negatively keyed

- Most foreign languages sound crude and harsh.
- I really have no interest in foreign languages other than English.

Instrumental orientation (*Study I a = .726; Study II a = .726*)

- Studying English is important because it will increase my ability to influence others.
- Studying English is important because it will make me appear more cultured.
- Studying English is important because it will give me an edge when competing with others.
- Studying English can be important to me because I think it will someday be useful in getting a good job.

Integrative orientation (*Study I a = .755; Study II a = .597*)

- Studying English is important because it will allow me to participate more freely in the activities of native English speakers.
- Studying English is important because it will allow me to gain good friends more easily amongst native English speakers.
- Studying English is important because it will enable me to better understand native English speaking life and culture.

Motivational intensity (*Study I a = .449; Study II a = .570*)

Positively keyed

- I make a point of trying to understand all the English I see and hear.
- I really work hard to learn English.

Negatively keyed

- I can't be bothered trying to understand the more complex aspects of the English language.
- I don't pay too much attention to the feedback I receive in my English class.

Appendix B: Dendrograms

Figure 1
Dendrogram of Dutch Data.

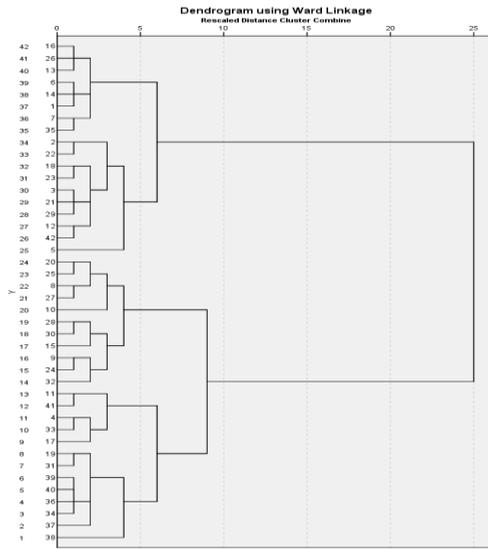
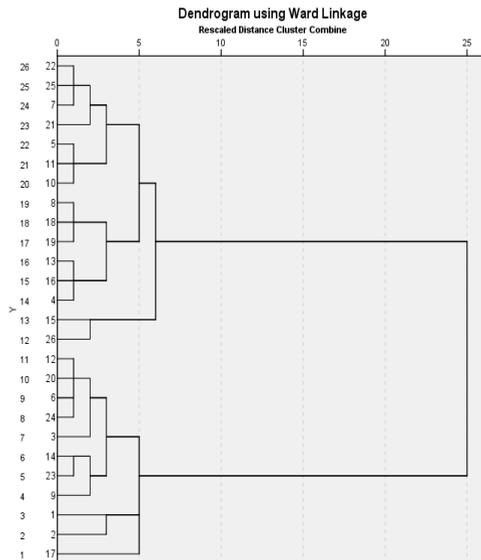


Figure 2
Dendrogram of Australian Data.



Appendix C: Descriptive statistics tables

Table 3

Descriptive Statistics of the Variables from the Dutch Data.

	N	Range	Mean	Std Dev	Skewness			Kurtosis		
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Err	Z-score	Statistic	St. Err	Z-score
SPP	42	6	5.50	1.469	-.412	.365	-1.13	-.435	.717	-.61
ANE	42	8	12.02	1.522	-.565	.365	-1.55	1.73	.717	2.41*
ALE	42	4	14.14	1.317	-.074	.365	-0.34	-1.14	.717	-1.63
DLE	42	6	13.69	1.522	-.404	.365	-1.11	-.332	.717	-.46
ECA	42	8	10.90	2.314	.022	.365	.06	-.922	.717	-1.29
EUA	42	7	13.50	2.027	-.341	.365	-.93	-1.003	.717	-1.40
IFL	42	8	12.83	2.059	-.328	.365	-.98	-.595	.717	-.86
ISO	42	9	10.36	2.128	-.350	.365	-.96	-.279	.717	-.39
ITO	42	9	11.62	1.780	-.287	.365	-.79	.777	.717	1.08
MOI	42	6	13.14	1.539	-.125	.365	-.04	-.636	.717	-1.08
SCO	42	10	16.40	2.678	-.465	.365	-1.27	-.474	.717	-.66

Note. * Z-score of kurtosis is significant at $p < .05$.

Table 4

Descriptive Statistics of the Variables from the Australian Data.

	N	Range	Mean	StdDev	Skewness			Kurtosis		
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Err	Z-score	Statistic	Std. Err	Z-score
SPP	26	6	5.04	1.371	-.478	.456	-1.05	.106	.887	.12
ANE	26	4	11.96	1.076	.081	.456	.178	-.474	.887	-.53
ALE	26	6	13.35	1.672	-.321	.456	-.70	-1.142	.887	-1.29
DLE	26	7	12.08	1.896	.110	.456	.24	-.524	.887	-.59
ECA	26	6	10.31	1.517	1.441	.456	3.16*	2.290	.887	2.58*
EUA	26	6	11.08	1.262	-.284	.456	-.62	1.062	.887	1.2
IFL	26	8	11.62	2.099	.021	.456	.05	-.665	.887	-.75
ISO	26	7	13.04	1.612	-.378	.456	-.83	.838	.887	.94
ITO	26	6	12.69	1.517	-.250	.456	-.55	.198	.887	.22
MOI	26	9	11.62	1.961	-.997	.456	-2.19*	1.428	.887	1.6
SCO	26	7	14.12	1.818	.464	.456	1	-.443	.887	-.5

Note. * Z-score of kurtosis is significant at $p < .05$.

Appendix D: Correlation coefficient tables

Table 5
Kendall's Tau Correlation Coefficient of the Dutch Data.

	SPP	ANE	ALE	DLE	ECA	EUA	IFL	ISO	ITO	MOI	SCO
SPP	1.000	-.070	-.021	.027	.502*	.466*	.133	.138	-.084	.037	.605*
Sig. (2-tailed)		.576	.864	.829	.000	.000	.274	.259	.498	.768	.000
ANE	-.070	1.000	.017	.164	-.050	-.008	.010	.084	.300*	.311*	-.101
Sig. (2-tailed)	.576		.891	.187	.678	.946	.937	.492	.016	.012	.406
ALE	-.021	.017	1.000	.327*	-.029	.068	.220	.215	.391*	.289*	.083
Sig. (2-tailed)	.864	.891		.009	.814	.581	.072	.079	.002	.020	.493
DLE	.027	.164	.327*	1.000	.059	-.005	.156	.050	.331*	.356*	.069
Sig. (2-tailed)	.829	.187	.009		.623	.964	.197	.678	.007	.004	.568
ECA	.502*	-.050	-.029	.059	1.000	.487*	-.186	.132	-.073	-.173	.651*
Sig. (2-tailed)	.000	.678	.814	.623		.000	.114	.263	.543	.147	.000
EUA	.466*	-.008	.068	-.005	.487*	1.000	-.052	.099	-.006	-.001	.572*
Sig. (2-tailed)	.000	.946	.581	.964	.000		.664	.410	.964	.991	.000
IFL	.133	.010	.220	.156	-.186	-.052	1.000	-.024	.217	.317*	-.064
Sig. (2-tailed)	.274	.937	.072	.197	.114	.664		.842	.072	.009	.587
ISO	.138	.084	.215	.050	.132	.099	-.024	1.000	.353*	.049	.135
Sig. (2-tailed)	.259	.492	.079	.678	.263	.410	.842		.004	.687	.253
ITO	-.084	.300*	.391*	.331*	-.073	-.006	.217	.353*	1.000	.406*	-.008
Sig. (2-tailed)	.498	.016	.002	.007	.543	.964	.072	.004		.001	.946
MOI	.037	.311*	.289*	.356*	-.173	-.001	.317*	.049	.406*	1.000	-.032
Sig. (2-tailed)	.768	.012	.020	.004	.147	.991	.009	.687	.001		.789
SCO	.605*	-.101	.083	.069	.651*	.572*	-.064	.135	-.008	-.032	1.000
Sig. (2-tailed)	.000	.406	.493	.568	.000	.000	.587	.253	.946	.789	

Note. All significant correlations are marked with *.

Table 6
Kendall's Tau Correlation Coefficient of the Australian Data.

SPP	1.000	.304	.298	.250	.073	-.078	.209	.149	-.028	.111	.334*
Sig. (2-tailed)		.069	.069	.122	.661	.641	.198	.361	.864	.498	.039
ANE	.304	1.000	.409*	.490*	.156	.315	.345*	.232	.421*	.448*	.414*
Sig. (2-tailed)	.069		.012	.002	.349	.059	.033	.155	.011	.006	.010
ALE	.298	.409*	1.000	.562*	.263	.254	.540*	.456*	.350*	.525*	.525*
Sig. (2-tailed)	.069	.012		.000	.107	.120	.001	.004	.030	.001	.001
DLE	.250	.490*	.562*	1.000	.185	.225	.302	.366*	.448*	.554*	.389*
Sig. (2-tailed)	.122	.002	.000		.249	.161	.053	.020	.005	.000	.013
ECA	.073	.156	.263	.185	1.000	.246	.319*	-.043	-.072	.145	.249
Sig. (2-tailed)	.661	.349	.107	.249		.138	.048	.794	.663	.376	.121
EUA	-.078	.315	.254	.225	.246	1.000	.188	-.004	.193	.312	.419*
Sig. (2-tailed)	.641	.059	.120	.161	.138		.244	.981	.242	.056	.009
IFL	.209	.345*	.540*	.302	.319*	.188	1.000	.272	.197	.334*	.333*
Sig. (2-tailed)	.198	.033	.001	.053	.048	.244		.085	.219	.035	.033
ISO	.149	.232	.456*	.366*	-.043	-.004	.272	1.000	.439*	.439*	.453*
Sig. (2-tailed)	.361	.155	.004	.020	.794	.981	.085		.007	.006	.004
ITO	-.028	.421*	.350*	.448*	-.072	.193	.197	.439*	1.000	.584*	.380*
Sig. (2-tailed)	.864	.011	.030	.005	.663	.242	.219	.007		.000	.017
MOI	.111	.448*	.525*	.554*	.145	.312	.334*	.439*	.584*	1.000	.472*
Sig. (2-tailed)	.498	.006	.001	.000	.376	.056	.035	.006	.000		.003
SCO	.334*	.414*	.525*	.389*	.249	.419*	.333*	.453*	.380*	.472*	1.000
Sig. (2-tailed)	.039	.010	.001	.013	.121	.009	.033	.004	.017	.003	

Appendix E: ANOVA, Post-Hoc and t-test tables

Table 7

Summary of One-way ANOVAs of Dutch data (N=42).

Dependent Variables	Sum of Squares	df	F	p
<i>Self-Perceived Proficiency</i>				
Between groups	34.144	2	12.249	.000
Within groups	54.356	39		
Total	88.500	41		
<i>Attitudes to Native English Speakers</i>				
Between groups	11.310	2	2.636	.084
Within groups	83.667	39		
Total	94.976	41		
<i>Attitudes to Learning English</i>				
Between groups	18.309	2	6.757	.003
Within groups	52.834	39		
Total	71.143	41		
<i>Desire to Learn English</i>				
Between groups	17.744	2	4.480	.018
Within groups	77.232	39		
Total	94.976	41		
<i>English Class Anxiety</i>				
Between groups	130.339	2	28.468	.000
Within groups	89.280	39		
Total	219.619	41		
<i>English Use Anxiety</i>				
Between groups	66.999	2	12.872	.000
Within groups	101.501	39		
Total	168.500	41		
<i>Interest in Foreign Languages</i>				
Between groups	12.786	2	1.548	.225
Within groups	161.047	39		
Total	173.833	41		
<i>Instrumental Orientation</i>				
Between groups	29.263	2	3.649	.035
Within groups	156.380	39		
Total	185.643	41		
<i>Integrative Orientation</i>				
Between groups	21.022	2	3.765	.032
Within groups	108.882	39		
Total	129.905	41		
<i>Motivational Intensity</i>				
Between groups	24.476	2	6.568	.003
Within groups	72.667	39		
Total	97.143	41		
<i>Self-Confidence</i>				
Between groups	193.648	2	37.585	.000
Within groups	100.471	39		
Total	294.119	41		

Note. Significant differences between clusters are noted with *.

Table 8
Post-hoc Analyses of ANOVAs Calculated From Dutch Data (N=42).

Comparisons	Mean Difference	Std. Error	p
<i>Hochberg's Comparison for Self-Perceived Proficiency</i>			
Cluster 1 vs. Cluster 2	1.779*	.385	.000
Cluster 1 vs. Cluster 3	2.088*	.656	.009
Cluster 2 vs. Cluster 3	.310	.644	.949
<i>Hochberg's Comparison for Attitudes to Native Speakers</i>			
Cluster 1 vs. Cluster 2	.333	.478	.863
Cluster 1 vs. Cluster 3	1.500	.814	.200
Cluster 2 vs. Cluster 3	1.833	.799	.079
<i>Hochberg's Comparison for Attitudes to Learning English</i>			
Cluster 1 vs. Cluster 2	.513	.380	.452
Cluster 1 vs. Cluster 3	1.809*	.647	.024
Cluster 2 vs. Cluster 3	2.321*	.635	.002
<i>Hochberg's Comparison for Desire to Learn English</i>			
Cluster 1 vs. Cluster 2	.342	.459	.839
Cluster 1 vs. Cluster 3	1.956*	.782	.049
Cluster 2 vs. Cluster 3	2.298*	.768	.014
<i>Hochberg's Comparison for English Class Anxiety</i>			
Cluster 1 vs. Cluster 2	3.272*	.494	.000
Cluster 1 vs. Cluster 3	4.676*	.841	.000
Cluster 2 vs. Cluster 3	1.405	.825	.259
<i>Hochberg's Comparison for English Use Anxiety</i>			
Cluster 1 vs. Cluster 2	2.179*	.526	.001
Cluster 1 vs. Cluster 3	3.691*	.897	.001
Cluster 2 vs. Cluster 3	1.512	.880	.252
<i>Hochberg's Comparison for Interest in Foreign Languages</i>			
Cluster 1 vs. Cluster 2	.426	.663	.889
Cluster 1 vs. Cluster 3	1.515	1.129	.458
Cluster 2 vs. Cluster 3	1.940	1.109	.238
<i>Hochberg's Comparison for Instrumental Orientation</i>			
Cluster 1 vs. Cluster 2	1.378	.653	.117
Cluster 1 vs. Cluster 3	1.015	1.113	.741
Cluster 2 vs. Cluster 3	2.393	1.092	.099
<i>Hochberg's Comparison for Integrative Orientation</i>			
Cluster 1 vs. Cluster 2	.353	.545	.887
Cluster 1 vs. Cluster 3	2.147	.929	.075
Cluster 2 vs. Cluster 3	2.500*	.912	.027
<i>Hochberg's Comparison for Motivational Intensity</i>			
Cluster 1 vs. Cluster 2	.667	.445	.364
Cluster 1 vs. Cluster 3	2.000*	.759	.035
Cluster 2 vs. Cluster 3	2.667*	.745	.003
<i>Hochberg's Comparison for Self-Confidence</i>			
Cluster 1 vs. Cluster 2	4.176*	.524	.000

Cluster 1 vs. Cluster 3	5.176*	.892	.000
Cluster 2 vs. Cluster 3	1.000	.876	.589

Note. Significant differences between clusters are noted with *.

Table 9

Summary of Independent Samples T-tests of Australian data (N=26).

Dependent Variables	t	df	Sig. (two-tailed)	Mean Difference	Std. Error Difference
<i>Self-Perceived Proficiency</i>					
Equal variances assumed	1.298	24	.207	.690	.532
<i>Attitudes to Native English Speakers</i>					
Equal variances assumed	3.235*	24	.004	1.167	.361
<i>Attitudes to Learning English</i>					
Equal variances assumed	8.052*	24	.000	2.810	.349
<i>Desire to Learn English</i>					
Equal variances assumed	3.865*	24	.001	2.310	.598
<i>English Class Anxiety</i>					
Equal variances assumed	1.514	24	.143	.881	.582
<i>English Use Anxiety</i>					
Equal variances not assumed ^	1.867	24	.079	.917	.491
<i>Interest in Foreign Languages</i>					
Equal variances assumed	4.659*	24	.000	2.845	.611
<i>Instrumental Orientation</i>					
Equal variances assumed	2.909*	24	.008	1.619	.556
<i>Integrative Orientation</i>					
Equal variances assumed	3.099*	24	.005	1.595	.515
<i>Motivational Intensity</i>					
Equal variances not assumed ^	3.674*	24	.002	2.381	.648
<i>Self-Confidence</i>					
Equal variances assumed	4.925*	24	.000	2.536	.515

Note. Levene's test for equality of variance was significant, thus equal variance is not assumed and marked with ^. Significant differences between clusters are marked with *.