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Cultural differences in Tertiary Students' Conceptions of Learning as a Duty and Student Achievement

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Abstract

Differences in Asian and European tertiary students' conceptions of learning as a duty were examined in two studies. Study 1, (N = 231), found ethnic differences in the students' emotional responses to a self-reported situation where they felt a duty to learn something at school or university. Specifically, Asian students reported significantly higher levels of negative emotions in response to their self-reported duty scenario (e.g., guilt, unhappiness and anger) than European students. Study 2, (N= 351), aimed to investigate whether a revised conception of learning as a duty factor could be found in a sample of Asian and European tertiary students, whether cultural differences existed to the extent to which the learning as a duty factor was endorsed by each cultural group, and how this learning as a duty factor related to student achievement. Using Structural Equation Modelling, three first-order learning as a duty factors were identified (duty to obtain qualification, duty to learn for others, and duty to work hard) with good model fit. Multiple-group confirmatory factor analysis found the Asian students and European students endorsed the three learning as a duty factors differently, and subsequent analysis found the relationship between the three learning as a duty conceptions and achievement differed across the two ethnic groups. Asian students had statistically significant paths from all three learning as duty factors to achievement, while the model for European students, had only one significant path to achievement (duty to work hard). This is the first study to explore ethnic differences in tertiary undergraduate students' conceptions of learning as a duty and to demonstrate ethnic differences in the relationship between learning as a duty conceptions and student achievement.

Key words: conceptions of learning, duty, obligation, ethnic differences, achievement

Learning is a treasure that will follow its owner everywhere. ~Chinese Proverb

Few would disagree with the notion that learning is valuable and important for numerous life outcomes, yet at the same time, conceptions of what learning is vary considerably. In the late 1970s, Roger Säljö conducted the first phenomenological study asking people what learning meant for them. He identified five broad conceptions: that learning is about increasing knowledge, memorising what has to be learnt, applying and using information, understanding, and seeing things in a different way (Säljö, 1979). These conceptions of learning highlight the 'what is learning' and 'how do I learn and know what I have learnt' aspects of learning (Peterson, Brown, & Irving, 2010) and have been repeatedly identified in subsequent qualitative and quantitative studies investigating conceptions of learning (e.g., Boulton-Lewis, Marton, Lewis, & Wils, 2004; Makoe, Richardson, & Price, 2007; Marton, Dall'Alba, & Beaty, 1993; Purdie & Hattie, 2002).

Some researchers have suggested that these different conceptions of learning form a hierarchy whereby students develop from having what Säljö (1979) calls 'reproductive' conceptions (e.g., learning is about gaining information and increasing knowledge) to 'reconstructive' conceptions (e.g., learning is about understanding and making meaning out of information) (e.g., see also Boulton-Lewis, Marton, Lewis, & Wils, 2004; Van Rossum & Hamer, 2010). Others have argued that rather than forming a developmental hierarchy, each conception should be thought of as a qualitatively different pattern of learning (e.g., Haggis, 2003; Makoe, Richardson, & Price, 2007). Regardless of whether these conceptions are viewed developmentally or not, Van Rossum and Hamer have argued in their recent book (*The Meaning of Learning and Knowing*), that by the end of higher education, students should have level 4 teaching and learning conceptions. That is, they should be able to show logical, critical and independent thought and be able to connect and apply knowledge flexibly to address new problems (p.515).

Over the years, researchers have also expanded on the Säljö (1979) initial five conceptions of learning models to include, among others, the 'why' aspects of learning such as the notion of learning as a duty (Peterson, Brown, & Irving, 2010). The conception of '*learning as duty*' was first identified by Purdie, Hattie and Douglas (1996) in a qualitative study comparing Japanese and Australian secondary school students' descriptions of what they meant by "learning" and what they meant if they said they had "learned" something. Fourteen (7%) of the Japanese students surveyed mentioned learning in terms of an obligation, whereas only one Australian student mentioned this category. Cliff (1998) later confirmed the existence of a duty conception of learning both qualitatively (N=36) and quantitatively (N=56) in a postgraduate sample. More recently, the conception of learning as a duty has been linked to student academic achievement with Peterson et al. finding that 14-year-old school students who believed that learning was a duty, achieved lower academic achievement scores in both mathematics and reading.

It is commonly accepted that cultural differences exist with respect to notions of duty and obligation (Triandis & Suh, 2002) and it is likely that beliefs about learning also reflect these cultural differences. Indeed, Li (2012) argues that "learning is not just academic for Chinese/Asians; it is, more centrally a personal moral obligation and commitment" (p.139). In Confucian heritage cultures, learning requires personal responsibility, perseverance and hard work suggesting the need for autonomy and responsibility, however, at the same time, social cohesion and connectedness are also vital, resulting in importance being placed on the fulfilment of family obligations and the needs of others over the needs of the self (Koh, Shao, & Wang, 2009).

While those who come from more individualistic cultures may view feeling obligated to learn negatively, this may not be how Asians interpret that duty. A recent study by Buchtel (2009) found that when compared to Euro-Canadians, Asians and Chinese viewed obligation

more positively, reporting a positive emotional response to situations in which they were obligated to help others. A strong portrayal of effort to meet parental expectations was also portrayed by Hong Kong Chinese university students in their drawings of assessment (Brown & Wang, 2011), consistent with Confucian notions of obligation to parents (Ho, 1986).

As noted above, Peterson et al. (2010) found that the belief 'learning is a duty' was negatively related to academic achievement among New Zealand secondary school students. This may have occurred because the students reporting higher levels of a sense of duty to learn may have viewed this duty as a negative imposition upon them, leading then to feel emotions such as anger or frustration and ultimately resulting in a negative impact on their achievement. Cultural differences in this study were not examined as only 15% of the sample identified themselves as being of Asian descent.

Cross-cultural differences have also repeatedly been found in self-reported emotional experiences, particularly with respect to the degree of self-reported positive emotions (Scollon, Koh, & Au, 2011). In general, individuals from more individualistic cultures rate positive emotions as more desirable and appropriate than individuals from more collectivist cultures (Eid & Diener, 2001). Similarly, those from individualistic cultures value and seek out more positive states (e.g., excitement), whereas those from more collectivist cultures tend to show a preference for lower levels of arousal, seeking states of calmness (Tsai, Louie, Chen, & Uchida, 2007). In contrast, studies with Chinese and Taiwanese (collectivistic cultures) samples have reported greater anxiety, neuroticism and emotionality than Westerners (Yang, 1986), suggesting that Asian students on average tend to have stronger negative emotions.

Research has shown that people automatically identify emotion in terms of being positive or negative with respect to pleasantness (e.g., calm vs annoyed), and they can also identify whether an emotion is socially engaging (e.g., respect and guilt) or disengaging (pride and anger) (Kitayama, Mesquita, & Karasawa, 2006). Research in this area has found that Japanese students tend to report experiencing more engaging emotions compared to disengaging emotions, with Americans being the reverse (Kitayama et al. 2006). Together this cross-cultural research on emotion suggests that there may be cultural differences in the emotional response students feel when learning something out of a sense of obligation or duty, and that this may differ depending on whether the emotion felt in relation to that obligation is viewed positively or negatively and whether the emotion is engaging or disengaging.

Another explanation for Peterson et al.'s (2010) finding that learning as a duty was negatively related to achievement is that the learning as a duty factor used in that study collapsed across a number of different aspects of duty; that is, the duty to learn for family and societal reasons, the duty to learn to get the qualifications, and a belief that working hard and persistence was important. A more fine grained approach to analysing the learning as duty conception that separates out these components may reveal some important differences, especially across European and Asian cultures.

This paper consists of two studies which attempt to address the research gaps identified above and extend the work of Peterson et al., (2010) by conducting this study with a group of tertiary students. In Study 1, participants were asked to describe a recent time when they felt obligated and a sense of duty to learn something, and whether they felt a range of positive or negative emotions at the time. In Study 2, we extended Peterson et al.'s conception of learning as a duty factor by adding in additional items related to having a sense of duty to learn for family, religious or societal reasons, for attaining qualifications or because of a general belief in the importance of studying hard. We explored the factor structure of this new conceptions of learning as a duty factor and examined the extent to which Asian and European tertiary students endorsed the different factors. Finally, we

explored the relationship between the students' learning as a duty conceptions and their academic achievement.

Study 1

Study 1 was conducted to investigate whether Asian university students and European university students living in New Zealand self-reported different emotional responses when they recalled a situation in which they felt a duty to learn something for school or university.

Method

Participants.

A total sample of 321 New Zealand tertiary students in one university participated in this study. Students were asked to identify whether they mostly identified themselves as New Zealand European/Pakeha, Maori, Pacifica, Asian, Middle Eastern or Other. If any of the latter four options were selected, they were asked to state with which ethnicity in particular they identified. For the purposes of this study, only those who identified themselves as New Zealand European/Pakeha or Asian were selected, resulting in a final sample of 231 participants. Within this selected sample, 82 (35.5%) classified themselves as New Zealand European/Pakeha, and most of them (85%) stated that they were born in New Zealand. With respect to those who identified themselves as Asian, the majority (75%), described their ethnicity as being from South East Asia (e.g., Chinese, Taiwanese, Vietnamese) and the remainder as being from West Asia (e.g., Indian or Sri Lankan). Most (75%) of the students who identified themselves as Asian stated they were born outside New Zealand.

The majority of the European and Asian participants were female (64%), with a mean age of 20 ($SD=4.0$). The average number of years of tertiary education completed was 2.6 years ($SD=1.3$). All participants were enrolled in a General Education course on "How People Learn" and the majority were studying towards either a Bachelor of Science (38%), a Bachelor of Arts (25%) or Bachelor of Commerce (14%).

Procedures.

Participants filled out a questionnaire at the beginning of the course that included questions on demographic information and established self-report scales asking about their approaches to and motivations for learning (these findings are not reported here). The participants were also asked to briefly describe a recent time (i.e., in the last year) when they felt obligated or a sense of duty to learn something. Only those who reported a learning event related to studying at school or university were included in the analysis. Following this description, participants were asked to reflect on the event and rate how strongly they felt a set of emotions on a scale of 1 (not experienced at all) to 6 (experienced very strongly). The emotions selected were a subsample of those used by Kitayama et al., (2006) and consisted of socially engaging emotions (positive and negative) and socially disengaging emotions (positive and negative), and socially neutral emotions (positive and negative) (see Table 1).

Table 1

Emotions used in the Study and the Category to which they Belong (based on Kitayama et al. 2006)

Socially Engaging		Socially Disengaging		Socially Neutral	
Positive	Negative	Positive	Negative	Positive	Negative
Close	Guilt	Proud	Sulky	Calm	Annoyed
Respect	Ashamed	Self-respect	Frustrated	Elated	Disgusted
Friendly			Angry	Happy	Unhappy
				Relaxed	Bored
				Competent	

Results

Participants described a number of different events related to a duty or obligation to learn. Most responses were general, and referred to an obligation to learn for tests, exams or specific courses (80%). The next most common obligation to learn was with respect to learning for a particular career or degree requirement (12%).

The self-reported strength of emotion data were analysed as six scales (Table 1) using IBM SPSS version 20. The six emotion related scales were found to be reliable (Cronbach's alpha ranged .79 - .88). The mean strength of each emotion reported when reflecting on a sense of duty to learn something is shown in Table 2.

Table 2

Ethnic differences in the Mean and Standard Deviations for each Emotion Type

Ethnic Group by Birth Place	Positive Engagement		Negative Engagement	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
European NZ born	3.35	1.17	1.98 ^a	1.19
European overseas born	3.44	0.90	2.25	1.43
Asian NZ born	3.33	1.11	2.49	1.45
Asian overseas born	3.33	1.21	2.91 ^a	1.70
	Positive disengagement		Negative disengagement	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
European NZ born	4.22	1.31	2.48 ^{c,d}	1.30
European overseas born	4.06	1.50	2.83	1.29
Asian NZ born	3.82	1.28	3.31 ^c	1.33
Asian overseas born	3.67	1.48	3.25 ^d	1.51
	Positive Social (Neutral)		Negative Social (Neutral)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
European NZ born	3.52	1.12	2.22 ^e	1.17
European overseas born	3.25	1.36	2.61	1.25
Asian NZ born	3.05	0.89	2.88	1.10
Asian overseas born	3.21	1.18	2.98 ^e	1.34

Note: ^{a,b,c,d,e} matching superscripts indicated statistically different means ($p < .001$); NZ = New Zealand.

To examine if cultural differences would be found in the levels of reported emotion, an Analysis of Variance was conducted. Main effects were found for all negative emotions (i.e., engagement, disengagement, and neutral) and a main effect for positive disengagement emotions. A Bonferroni post-hoc test (with Bonferroni Corrections applied to reduce the chance of family-wise error rates (i.e., $p < .01$)) found that, in all cases, the statistically significant differences were between Europeans born in New Zealand and Asians living in New Zealand but born overseas. Additionally, in the case of negative disengagement, a statistically significant difference was also found between both Europeans and Asians born in New Zealand.

The direction of all the negative emotion effects was such that European students reported less negative emotions when responding to a duty to learn something (i.e., less guilt, shame, frustration, anger, annoyance, boredom, annoyance and unhappiness) than the Asian students. A main effect for positive disengagement was not significant when the Bonferroni correction was applied.

Discussion

Study 1 found significant ethnic differences in the strength of tertiary students' emotions to a self-reported situation where they felt a duty to learn something at school or university. In general, Asian students living in New Zealand (but mainly born overseas) reported significantly higher levels of negative emotions in response to a duty scenario (e.g., guilt, unhappiness and anger) than New Zealand born Europeans. This stands in contrast to Scollon et al.'s (2011) review which reports that few cultural differences in self-reported negative emotions and greater cultural differences in positive emotions. However, it is in keeping with Yang's (1986) review that Chinese tend to score more highly on measures of anxiety, neuroticism and emotionality, although Yang cautions it is important to consider the cultural context and resources available to participants when making such comparisons.

As expected, Asian students born overseas did report statistically significant higher levels of negative socially engaging emotions (i.e., guilt and shame) compared to New Zealand born European students and these negative emotions may have motivated them to learn. This finding is in keeping with the Kitayama et al. (2006) finding in which Japanese students reported more engaging emotions than American students. However the fact that Asian students also reported more negative disengaging emotions may cancel out any motivational effects of reported engaging emotions.

It is unlikely that these effects are due to the retrospective recall of the emotion felt in response to the self-reported duty scenario. Indeed, research suggests that greater cultural differences are typically found when emotions are self-reported retrospectively (Scollon et al., 2011).

Study 2

Study 2 had two main aims. Firstly, to investigate whether Peterson et al.'s (2010) conception of learning as a duty factor, initially identified in secondary school students, could be expanded to capture different components of the learning as a duty conception and if the factor structure could be recovered in a tertiary student sample. The second aim was to investigate whether cultural differences existed to the extent to which the learning as duty factor was endorsed by Asian and European students and how this related to their grade point average (GPA).

Method

Participants.

A total sample of 351 tertiary students from one university participated in this study. Like Study 1, participants could select their main ethnicity from one of five groups (New Zealand European/Pakeha, Maori, Pacifica, Asian, Middle Eastern, or Other). Only those participants who identified themselves as New Zealand European/Pakeha or Asian were included in the analysis resulting in a final sample of 271 participants. Within that selected sample 119 (33%) identified themselves New Zealand European/Pakeha and 152 (43%) as Asian. Of those who identified as Asian, most (73%), stated they were South East Asian (e.g., Chinese, Taiwanese, Malaysian) and the remainder stated they were West Asian (e.g., Indian, Sri Lankan, Bagladeshi).

A small proportion of the students of European decent had been born outside New Zealand (12%); whereas, 75% of the Asians in the sample were born outside New Zealand. The majority of the sample were female (66%), with a mean age of 20.4 ($SD= 4.2$). The average number of years of tertiary education completed was 2.6 years ($SD = 1.3$). All participants were enrolled in a General Education course on "How People Learn" and the majority were studying towards either a Bachelor of Science (40%), Bachelor of Arts (17%), or Bachelor of Commerce (28%).

Procedures.

Participants filled out a questionnaire at the beginning of the course which included questions on demographic information and a revised version of Peterson et al.'s (2010) Conceptions of Learning III Inventory. Only the conception of Learning as a Duty items were analysed for this study (see Table 3 for revised items). Student permission was also given to access their GPA.

Table 3

Final items making up the Three Learning as a Duty Factors and their Standardized Beta Weights. Cronbach's Alphas are provided for the full Sample.

Questionnaire Items	Full Sample (n= 351) standardised β	Asians (n= 152) with GPA standardised β	Europeans (n= 119) with GPA standardised β
<i>Duty to get the qualifications</i> (Cronbach's alpha .86)			
I learn so I can get the qualification I need for my future	.91	.89	.94
I learn to get the degree I need for my future	.85	.75	.91
<i>Duty to learn for others</i> (Cronbach's alpha .76)			
I learn to please my parents	.70	.60	.81
I learn because it is expected by family and society	.76	.75	.76
I learn because I owe it to the people who are paying my fees	.57	.46	.65
<i>Duty to work hard</i> (Cronbach's alpha .58)			
Learning is trying to do my best at all times	.68	.66	.83
If a task is difficult, I must concentrate and keep trying	.55	.69	.50
I need to work hard to learn	.51	.49	.31

Note: Three additional items were administered but two were deleted due to low factor loadings (<.50), one item was deleted to improve model fit. Deleted items were: I learn so I can contribute more to society, I learn because my religious or spiritual beliefs require it, I will learn the course material because it is a university requirement that I pass.

Data analysis.

Exploratory and Confirmatory factor analysis was conducted using IBM SPSS and IBM SPSS AMOS. Following this, multiple group confirmatory factor analysis (MGCFAs) in AMOS was conducted to examine the extent to which the learning as a duty factor was invariant across the Asian and European students only. Finally, to test whether learning as a duty related to academic performance, a multiple indicator, multiple cause (MIMIC) structural equation model was tested in which each first-order factor was regressed onto self-reported GPA. Multi-group invariance testing was used to determine statistical equivalence of models and the squared multiple correlation (SMC) was used to indicate the extent to which

the components of learning as duty explained GPA for both Asian and European students in New Zealand.

Determining appropriate indices of model fit continues to be a matter of debate (Barrett, 2007). Typically, multiple measures of goodness-of-fit (e.g., χ^2 , CFI, gamma hat) and badness-of-fit (e.g., SRMR, RMSEA) are reported (Fan & Sivo, 2005; Hu & Bentler, 1999). The standardised root mean square residual (SRMR) and gamma hat fit indices have been found to be the most robust against model misspecification, especially when the samples are small and the models are complex (Fan & Sivo, 2005). In this study, we accepted models as not being rejected with statistically non-significant χ^2 per *df*, CFI and gamma hat >.90, RMSEA<.08, and SRMR < .06.

Two samples can be argued to be configurally invariant if an equivalent factor structure is found between two samples with RMSEA <.05. When comparing two samples, metric or weak invariance can be claimed if the factor loadings (regression weights) are equivalent and scalar or strong invariance claimed when regression intercepts or factor means are equivalent. Finally, residual or strict invariance is found when groups have the same manifest variable residual variance. Researchers have typically used Δ CFI as an index of difference in fit between two samples, which is less affected by sample size than χ^2 (Cheung & Rensvold, 2002; Vandenberg & Lance, 2000). While statistical equivalence between independently sampled groups is normally assumed to be a necessary precondition for the validity of a research instrument, this presumption may not hold when samples are taken from different populations. In that case, non-invariance may reflect real-world differences rather than deficiencies of instrumentation (Wu, Li, & Zumbo, 2007).

Results

Measurement model of learning as a duty.

Exploratory factor analysis with oblique rotation recovered a three-factor model of conceptions of learning. Confirmatory factor analysis was then conducted, with items loading less than .50 being deleted. Inspection of the modification indices suggested that the fit could be improved with the deletion of one additional item, resulting in a three factor model of learning as a duty (see Table 3 for the final set of items), with good fit ($\chi^2= 43.808$; *df* =,18, *p* = .001; χ^2 /*df* = 2.43, *p* = .12; CFI = .97; gamma hat = .99; RMSEA = .064, 90% CI = .040 - .088; SRMR = .051). The 2nd-order latent factor 'duty' explained 95% of the factor variance in the Duty to get qualifications factor, 26% of the factor variance of the Duty to learn factor, and 22% of the factor variance of the Duty to work hard factor .

Multiple group analysis of the conceptions of learning as a duty measurement model.

The results of the multi-group confirmatory factor analysis comparing the conceptions of learning as a duty, between students who identified as Asian and those who identified as Europeans, is shown in Table 4. The findings indicate that for the two groups, the model had configural and metric invariance (Δ CFI <.01); that is, weak invariance. The two groups differed in their factor means and hence strict invariance was not found. While some researchers (e.g., McArdle, 2007) have argued that metric invariance is sufficient to compare factor means between groups, most have argued for the need for strict invariance (Cheung & Rensvold, 2002; Vandenberg & Lance, 2000).

Table 4

Goodness-of-Fit and Invariance Statistics for Ethnic Differences (European and Asian) in the Measurement Model of Conceptions of Learning as a Duty

	Fit Statistics					Change			
	χ^2	<i>df</i>	CFI	RMS EA	SRMR	Δ CFI	$\Delta \chi^2$	Δ <i>df</i>	<i>p</i>
Unconstrained	60.66	36	.956	.050	.0755				
Measurement Weights	64.54	41	.958	.046	.0762	.002	3.88	5	.57
Measurement Intercepts	94.89	49	.919	.059	.0751	.039	30.34	8	.00

Note. CFI = comparative fit index; RMSEA=root mean square error of approximation; SRMR = standardized root mean residual; *n* (Europeans) =119, *n* (Asians) =152; *k* = 8.

Structural model of the conceptions of learning as a duty factor with GPA.

As weak metric invariance between the Asian and European students was found for the measurement model of learning as a duty, we tested a structural model of the three factors of 'learning as a duty' regressed onto GPA (see Table 5). Only configural invariance was found for this model, suggesting that the Asian and European samples of students were drawn from different populations and their conceptions of learning as a duty had statistically different relationships to achievement.

Table 5

Goodness-of-Fit and Invariance Statistics for Ethnic Differences (Europeans and Asians) in a Structural Model of Conceptions of Learning as a Duty regressed on GPA

	Fit Statistics					Change			
	χ^2	<i>df</i>	CFI	RMSEA	SRMR	Δ CFI	$\Delta \chi^2$	Δ <i>df</i>	<i>p</i>
Unconstrained	72.78	46	.955	.047	.0765				
Measurement Weights	88.78	54	.941	.049	.0830	.014	16.01	8	.04
Measurement Intercepts	121.35	63	.902	.059	.0824	.038	32.56	9	.49

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardised root mean residual; *n* (Europeans) = 119, *n* (Asians) =152; *k* = 9.

Structural model of the conceptions of learning as a duty factor with GPA in Asian and European students separately.

Since non-invariance was demonstrated in a MG MIMIC SEM, independent models of how 'learning as a duty' related to GPA were created for each group. Statistically non-significant paths to GPA were removed for each group. The model for European students had only one path (*Duty to work hard*), while the model for Asian students had statistically significant paths from all three factors of learning as duty. Model fit for each model was good. In addition, the variance explained in student GPA was also different (See Table 3 for factor to item loadings and Table 6 for factor to GPA path values).

Table 6

Fit Statistics for Structural Models linking Conceptions of Learning as a Duty to GPA in Europeans and Asian Students

	<u>Asian</u>	<u>European</u>
Model Fit Duty model with GPA	$\chi^2=39.193$; $df=23$, $p=.019$; $\chi^2/df = 1.704$, $p = .19$; CFI= .94; RMSEA= .068, 90% CI = .028 - .104; gamma hat= .98; SRMR = .07.	$\chi^2=33.704$; $df=25$ $p=.094$; $\chi^2/df = 1.388$, $p = .24$; CFI= .97; RMSEA= .057, 90% CI = .00 - .100; gamma hat= .98 SRMR = .08.
Duty Factors		
Qualification	$\beta = -.28$	<i>ns</i>
Obligation to Learn	$\beta = .37$	<i>ns</i>
Work hard	$\beta = .27$	$\beta = .46$
GPA (SMC)	.16	.21

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean residual; SMC = Squared Multiple Correlation; n (Europeans) = 119, n (Asians) = 152.

Discussion

Study 2 looked a sample of university students and found that the conception of learning as a duty had a three-factor structure. That is, the belief that learning as a duty was comprised of learning as a duty to get qualifications, a duty to learn for others, and a duty to work hard. This builds on the work of Peterson et al. (2010) who found that, in a sample of secondary students, a single conception of learning as a duty encompassed these three components.

This study also found that Asian students and European students endorsed the three learning as a duty factors differently, and that they had different relationships with academic achievement. While, Peterson et al. (2010) found that their single learning as a duty factor was negatively associated with achievement in secondary school students, the current study has enabled a more detailed exploration of the duty factor, which has identified how those different components of learning as a duty relate to academic achievement, as well as how these relationships vary across two ethnic groups.

The current study found that for Asian students all three learning as a duty factors related significantly to achievement. Specifically, the duty to learn in order to gain a qualification had a negative loading on achievement ($\beta = -.28$), while the duty to learn out of obligation ($\beta = .37$) and the duty to work hard ($\beta = .27$) had positive relationships to achievement. In contrast, among European students, only the conception of learning being a duty to work hard ($\beta = .46$) was positively related to achievement.

Limitations of the studies

These studies have a number of limitations and the findings need to be considered them. Firstly, while the participants self-identified their main ethnicity as Asian, we have not made distinctions between those who identified with West vs. South East Asian or Far East Asian countries. In Study 2 we also did not distinguish between those born in New Zealand and overseas. A more fine-grained ethnic analysis may find different results. Secondly, this study uses self-report questionnaires to assess students' beliefs about learning and what students actually do when they learn (their behaviour and emotion). These self-reported beliefs may be different from what they actually do and why they do it at that time. More research is also needed with students from other sectors (e.g., primary and secondary students) to see the

extent to which the findings, regarding emotion and a duty to learn and achievement, apply beyond the tertiary level.

Conclusion.

Despite these limitations, our findings reveal some important differences in how tertiary students (self-identifying as European or Asian) responded to the conception of learning as a duty. In brief, Study 1 found there were ethnic differences in the emotional response to learning as a duty, and Study 2 found there were three separate components of learning as a duty, which had different relationships to academic achievement for the two ethnic groups.

More specifically, our findings suggest that the emotional response to a self-reported duty to learn something at school or university was generally viewed more negatively by Asian students born overseas compared to New Zealand born Europeans. The negative emotions reported included emotions associated with increasing engagement (e.g., guilt, shame) and decreasing engagement (e.g., anger, frustration). These results suggest that Peterson et al.'s (2010) finding that a negative association exists between the conception of learning as a duty and academic achievement in secondary schools might not be because duty is associated only with a demotivating and disengaging emotional response. In our sample, a sense of duty to learn something was associated with negative engaging and negative disengaging emotions. It does however suggest that culture differences exist in how the conception of learning as a duty is perceived, with Asian students expressing, consistent with some literature, more overall negative emotionality to the duty to learn conception than European students.

Study 2 enabled a more fine-grained approach to exploring the relationship between the learning as a duty and academic achievement in Asian and European tertiary students. This is the first study to show that Asian and European students endorse the conception of learning as a duty differently, and that these differences seem to have important implications for student achievement, explaining between 16% and 21% of the GPA variance.

As noted above, Li (2012) argued that, for Chinese/Asians, learning is a personal commitment and moral obligation that requires perseverance and hard work. This seems to be reflected in the way that the three learning as a duty factors relate to achievement among the studied Asian students. Learning out of moral obligation to the collective culture (e.g., family and society) and learning as something that requires hard work, positively related to academic achievement. In addition, learning that focused on the need for a qualification was negatively associated with achievement. This may be because Asian students in this sample draw on an external motivator to learn, as opposed to a more intrinsic personal commitment to learning. In other words, it is possible that gaining a qualification for Asian students is a socially approved instrumental way of fulfilling one's duty towards family and society.

In contrast, European students, who can be argued to be more individualistic in their cultural values and approach, did not see a duty to learn through the same collectivist cultural lens. That is, they did not report needing to learn so to please society or family or to get the qualifications required, and instead saw learning as a more individual undertaking to work hard. Perhaps, for the Europeans, working hard may be seen as the best way to fulfil obligations to commitments (e.g., completing a degree) one has made by and for oneself.

The observed differences in these studies between culture groups were consistent with the research literature that collectivist and individualist populations have different responses to the notion of duty. Hence, the multi-group invariance techniques employed in confirmatory factor analysis and structural equation modelling were able to appropriately identify culturally-defined differences between the samples drawn from different populations. Overall, these findings suggest that future conceptions of learning questionnaires and research more generally, needs to take cultural variations in the learning as a duty conception

into account. These studies show that duty conceptions relate meaningfully to achievement and elicit culturally specific emotions and generate specific effects on achievement. Hence, there is a need to consider cultural differences in how the conception of learning as a duty affects student achievement.

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