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UNIVERSITY STUDENTS' PERSPECTIVES ON ACADEMIC MOTIVATORS: THE REMO-U SCALE

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Abstract: This study introduces the Relationship and Motivation at University (REMO-U) scale, adapted from the REMO scale, to explore the dynamics of motivation and social relationships among university students. Building on prior research, which examined the motivation of 7th and 8th-grade students, the REMO-U scale delves into the complex interplay between intrinsic and extrinsic motivation and how social relationships, both positive and negative, influence academic drive.

The REMO-U scale comprises five subscales: Peers as Positive Motivators (PPM), Peers as Negative Motivators (PNM), Individual Learning Behavior (ILB), Teachers as Positive Motivators (TPM), and Teachers as Negative Motivators (TNM). Through validation, correlations were established between PPM and TPM scores, as well as between PNM and TNM scores. Students who perceived peers and teachers as positive motivators displayed higher academic achievement drive and a strong pursuit of academic success.

However, those who perceived negative motivations from both peers and teachers tended to harbor negative attitudes toward academic achievement motivation and achievement goal orientation. This study recognizes the changing dynamics of motivation among university students, where social relationships and external influences play pivotal roles in shaping their academic drive.

Keywords: motivation, university students, social relationships, REMO-U scale, academic achievement, extrinsic motivation, intrinsic motivation

INTRODUCTION

Raufelder, Drury, Jagenow, Hoferichter and Bukowski (2013a) examined the motivation to study of 7th and 8th grade students (12- to 15-year-olds) in Brandenburg, Germany. This research explored the relevance of extrinsic motivation (associated with teachers, peers and a combination of the two) and intrinsic motivation. While some students identified their teachers and peers as positive motivators, others viewed them as negative motivators. Pupils who reported that they did not strongly view their classmates or teachers as academic motivators tended to prefer to learn alone. This study led to the construction of the Relationship and Motivation (REMO) scale which broadened focus from one specific aspect of motivation, also to include consideration of the interconnections between social relationships and motivation in school settings. After revision, the finalised version of the REMO scale consisted of 37 items with five subscales: Peers as Positive Motivators (PPM); Peers as Negative Motivators

(PNM); Individual Learning Behaviour (ILB); Teachers as Positive Motivators (TPM); and Teachers as Negative Motivators (TNM). Validation of the scale (Raufelder et al., 2013a) revealed correlations between PPM scores and TPM scores, as well as between PNM and TNM scores. Thus, pupils who viewed their peers as positive motivators also tended to view their teachers as positive motivators, and those who perceived their peers as negative motivators also tended to view their teachers as negative motivators. Pupils who perceived both their peers and teachers as positive motivators also typically scored higher on academic achievement drive scores and showed strong drive for academic success. However, those who perceived their peers and teachers as negative motivators were more likely to hold negative attitudes regarding academic achievement motivation and achievement goal orientation. Harmer (2007) suggested that learners of different ages have different learning characteristics, and suggested that, whilst children need constant stimulation from their teachers, adolescents put more value on the approval of their peers rather than their teachers. Harmer (2007) further proposed that the motivation of adult learners was usually high and came from within, rather than from other people. Many students commencing university move away from the family home, and therefore social relationships may take on greater importance (Cook et al., 2007; Brown & Theobald, 1999). It has been suggested that for some, the absence of parental incentives to encourage them to achieve academically can lead to a reduction in students' motivation (Hoyenga & Hoyenga, 1984). Extrinsic rewards and motivation (such as praise) would in such circumstances be drawn from others, such as students' peer group and/or lecturers/tutors. This research investigates the development and adaptation of the REMO scale for University students, creating a new scale derived from the REMO henceforth referred to as the Relationship and Motivation at University (REMO-U) scale.

MATERIAL AND METHODS

The participants in this study (N = 171) were all university students studying a variety of courses at different universities across the United Kingdom in either their first, second, third or fourth year at university. 152 full response sets were generated, with nearly two-thirds (65.1%) of the reduced dataset being female (N = 99) and the remainder (34.9%) being male (N = 53). The age distribution of the sample was as follows: 30.9% were aged between 16 and19 years; 65.8 % were aged 20-23 years; 0.7% were aged 24-27 years; 2.6% were aged 28+ years. Over half of the participants were in their 3rd year at university (54.6%), while 32.2% were in their first year, 7.2% in their second year and 5.9% reported they were in their fourth year of study.

REMO-U scale construction

The Relationship and Motivation at University (REMO-U) scale was created by adapting the Relationship and Motivation (REMO) scale of Raufelder et al (2013a). In order to modify the REMO scale to apply it to university students and create the REMO-U, three sets of words were changed. Whenever the words 'schoolwork' or 'homework' appeared in the REMO, they were replaced with the words 'study' or 'studying' in the new REMO-U, while the words 'school' and 'teacher' were also removed and replaced with the words 'university' and 'lecturer/tutor' respectively. The items and names of the five subscales were kept the same, with the exception of the aforementioned change to the word 'teacher'. The TPM and TNM subscales of the REMO therefore became the LPM and LNM subscales of the REMO-U respectively. The wording of the scales was kept as similar as

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possible in an attempt to maintain validity. The peers as motivators (P-REMO-U) subscales consisted of 21 items in total which were presented in the form of fourpoint Likert scales ('Strongly Disagree' = 1; 'Disagree' = 2; 'Agree = 3; 'Strongly Agree' = 4). This section of the questionnaire began with the cuing question, "With regards to your peers, how much do you agree with the following statements?" The PPM subscale consisted of 9 items, the PNM subscale consisted of 6 items and the ILB subscale also consisted of 6 items, with two items reverse scored. The entire P-REMO-U section of the REMO-U is shown in the results section of this report (see Table 5), with reverse scored items also indicated. The lecturers/tutors as motivators (L-REMO-U) subscales consisted of 16 items in total, which were presented as above on a four-point Likert scales. It began with the statement, "Please think about your lecturers/tutors in general. How much do you agree with the following statements?" The LPM subscale consists of 6 items and the PNM subscale consists of 10 items. All L-REMO-U items can be seen in the results section of this report. Average scores for the five subscales of the REMO-U were calculated for each participant, allowing data to be used from those who did not fully complete a subscale. The questionnaire was produced on Survey Monkey (www.surveymonkey.com), an online this research was carried out within the guidelines of ethical principles outlined in the British Psychological Society (BPS) Code of Human Research Ethics (2010).

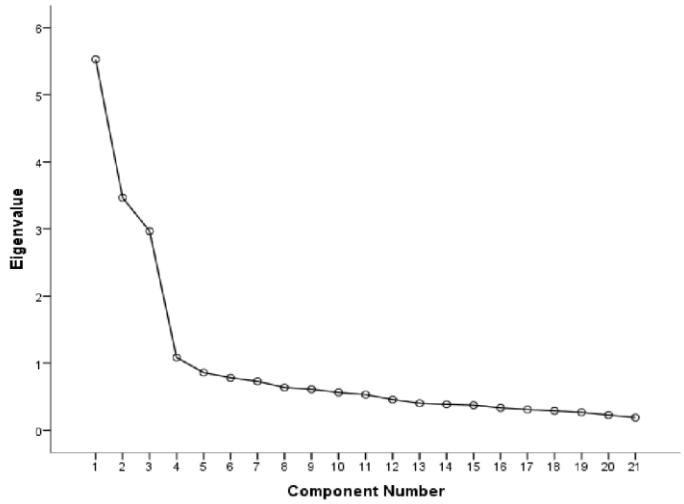
RESULTS

Factor analyses of the REMO-U

In order to confirm comparable dimensionality between the original REMO scale and the new REMO-U scale, a Principle Component Analysis (PCA) with varimax rotation was applied to the

REMO-U data set of both the items of the Peer Relationships and Motivation at University (PREMO- U) scale, and subsequently the items of the Lecturer/Tutor Relationships and Motivation at University (L-REMO-U) scale. The first Scree Plot (See Figure 1) supports retention of three components the P-REMO-U scale.

Figure 1. Scree plot of PCA for P-REMO-U items



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Analysis of the PCA results for the university data (Table 1) showed that the three components of the P-REMO accounted for 57.16% of the variance. Table 1 also presents the percentage of variance accounted for in each component of the P-REMO from the original REMO scale. As the overall cumulative percentage of variance for the P-REMO-U was higher than that of Raufelder at al.'s (2013a), it can be suggested that this section of the REMO-U has at least the same validity than the same section of the REMO. It is noted that, following factor analyses, the order of the components appears differently in the REMO-U than the REMO (1 = PPM; 2 = PNM; 3 = ILB).

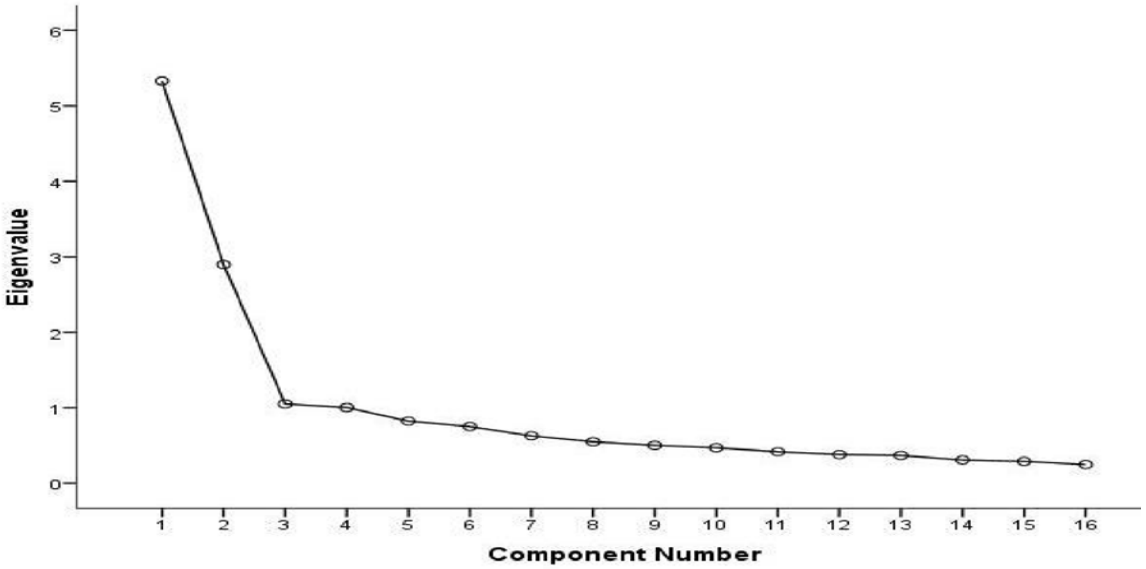
Table 1

Eigen value, percentages of variance and cumulative percentages for components of P-REMO-U varimax rotation (three component solution); including percentages of variance and cumulative percentages for components of the P-REMO. Boldface indicates overall cumulative percentage of variance for both scales.

P-REMO-U				**P-REMO**	
Component	Eigen Value	% of variance	Cumulative %	% of variance	Cumulative %
1 (PPM)	4.43	21.12	21.11	16.18	16.18
2 (ILB)	4.13	19.64	40.75	10.22	26.40
3 (PNM)	3.47	16.41	**57.16**	10.96	**37.36**

The second Scree Plot (see Figure 2) supports the retention of 2 components for the L-REMO-U data.Table 3 shows that the two factors accounted for 51.40% of the variance. It also shows the percentage of variance accounted for in each factor of the original T-REMO.

Figure 2. Scree plot of PCA for L-REMO-U items.



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As the overall cumulative percentage of variance for the L-REMO-U was higher than that of Raufelder at al.'s (2013a) T-REMO, it can be suggested that this section of the REMO-U has at least the same validity than the same section of the REMO. It is noted that, following factor analyses, the order of the components appears differently in the REMO-U than the REMO (1 = TNM; 2 = TPM).

Table 3

Eigen value, percentages of variance and cumulative percentages for components of L-REMO-U varimax rotation (two component solution), including percentages of variance and cumulative percentages for components of the T-REMO. Boldface indicates overall cumulative percentage of variance for both scales.

L-REMO-U				**T-REMO**	
Component	Eigen Value	% of variance	Cumulative %	% of variance	Cumulative %
1 (LNM)	5.26	32.85	32.85	14.67	14.67
2 (LPM)	2.97	18.55	**51.40**	26.33	**41.00**

The item loadings on each of the two components of the L-REMO-U scale are presented below in Table 4. These confirmatory analyses show that the REMO-U has the same factor structure as the REMO scale, displaying the presence of the expected three- and two- factor models. This confirms similarity between the original REMO scale and the new REMO-U scale.

The item loadings on each of the three components of the P-REMO-U scale are presented below in Table 2.

Table 2

Summary of items of components loadings for Varimax Orthogonal Three-Factor Solution for the P-REMO-U Scale.

Items P-REMO-U	C1	C2	C3
Peers as Positive Motivators (PPM)			
1. When my friends want to improve their grades, I also want to do better.	**.81**	− .05	− .06
2. I make an effort at studying when my friends motivate me.	**.76**	− .20	− .03
3. When my friends learn, I am also motivated to learn more.	**.76**	− .07	− .17
4. Because of my friends, I try to make more of an effort at university.	**.72**	− .19	.06
5. It is easier to do well in university when my friends motivate me.	**.68**	− .08	− .05
6. My friends and I motivate each other to make an effort at university.	**.63**	− .24	− .29

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7. I will study harder for an exam when my friends tell me that they are also working hard.	**.64**	− .07	.03
8. At university I try to make similar effort to that of my friends.	**.59**	− .17	.29
9. I like to make an effort at university as my friends then tell me that I am clever.	**.57**	.06	.16

Items P-REMO-U	C1	C2	C3
Individual Learning Behaviour (ILB)			
1. When an exam is approaching, I prefer to study on my own.	− .14	**.85**	− .09
2. I can learn better on my own compared to when I work with others.	− .08	**.83**	− .05
3. I learn best when I work together with my friends. (-)	− .24	**.82**	− .03
4. Studying for a test is easier when my friends and I work together. (-)	− .12	**.82**	− .02
5. I never study with my friends; I always do it on my own.	− .07	**.78**	.17
6. It is easier to succeed at university when you work on your own rather than with others.	− .09	**.74**	.06
Peers as Negative Motivators (PNM)			
1. If my friends were not interested in university, I also would not make an effort.	− .04	− .02	**.79**
2. At times, I do not make an effort at university because my friends say that it is uncool to try.	− .13	.02	**.77**
3. If my friends were to say that good grades do not matter, I would study less.	− .06	.09	**.71**
4. When my friends find university boring, I also tend to find university tiresome.	.26	.07	**.71**
5. My friends pay more attention to me when I make less of an effort at university.	.06	− .04	**.71**
6. My friends encourage me to spend as little time as possible on studying.	− .02	− .05	**.67**

Note. Factor loadings > .40 are in boldface. P-REMO-U = Peer-Relationships and Motivation at University; (-) = negatively scored question.

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Comparisons between the REMO-U scale and the REMO scale.

Internal consistency reliabilities of the scores of each of the five subscales were examined and were all found to have Cronbach's α ratings > 0.7, suggesting good internal consistency (Nunnally, 1978).

Table 4

Summary of items of components loadings for Varimax Orthogonal Two-Factor Solution for the L-REMO-U Scale.

Items L-REMO-U	C1	C2
Lecturers/Tutors as Negative Motivators (LNM)		
1. When I think the lecturer/tutor does not believe in me, I don't make an effort to do well.	**.81**	.16
2. When I do not like a lecturer/tutor, I am not interested in the subject.	**.78**	− .03
3. When I don't like a lecturer/tutor, I get tired of the subject.	**.77**	.08
4. When a lecturer/tutor doesn't notice that I am making an effort, I stop trying.	**.73**	.01
5. When a lecturer/tutor does not try to help me, I usually give up.	**.73**	.06
6. When a lecturer/tutor is not interested, I cannot be interested.	**.69**	.04
7. When I think a lecturer/tutor does not like me, I have trouble being inspired by the subject.	**.68**	.21
8. If a lecturer/tutor never gives me a good grade in a subject, I stop caring about how I do in that subject.	**.67**	− .04
9. Whether I like or dislike a lecturer/tutor has influence on how much I learn.	**.65**	.08
10. When a lecturer/tutor bores me, I do not learn anything at all.	**.65**	− .16
Lecturers/Tutors as Positive Motivator (LPM)		
1. When a lecturer/tutor notices that I have tried my best, I will try to give my best again in the future.	− .13	**.79**
2. I will make more of an effort in a subject when I think the lecturer/tutor believes in me.	− .01	**.77**
3. When a lecturer/tutor takes her/his time to explain something to me, I will make more effort the next time.	− .02	**.72**
4. When a lecturer/tutor helps me, I try to do well in the subject.	− .05	**.71**
5. When a lecturer/tutor likes me, I make more effort in the subject.	.27	**.63**
6. A lecturer's/tutor's enthusiasm in a subject matter motivates me to learn more.	.15	**.47**

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Note. Factor loadings > .40 are in boldface. L-REMO-U = Lecturer/Tutor-Relationships and Motivation at University.

Comparisons were also made between the Cronbach's α scores for the five components of the REMO-U scale and the REMO scale (see Table 5).

Table 5

Internal consistency reliability scores (Cronbach's α) for each subscale of both the REMO scale and the REMO-U scale.

Subscale	Number of items	Example	α for the REMO sc ale	α for the REMO-U scale
PPM	9	I make an effort at studying when my friends motivate me.	.80	.86
PNM	6	My friends pay more attention to me when I make less of an effort at university.	.73	.82
ILB	6	I can learn better on my own compared to when I work with others.	.80	.90
LPM	6	When a lecturer/tutor likes me, I make more effort in the subject.	.78	.78
LNM	10	When a lecturer/tutor is not interested, I cannot be interested.	.82	.89

Note. N = 155, PPM = Peers as Positive Motivators; PNM = Peers as Negative Motivators; ILB = Individual Learning Behaviour; LPM = Lecturers/Tutors as Positive Motivators; LNM = Lecturers/Tutors as Negative Motivators.

It is noted that all Cronbach's α scores for each subscale (apart from LPM) of the REMO-U were higher than those of the REMO scale. The LPM subscale scored equally on both. This not only suggests that the REMO-U has good internal consistency, but in fact has greater reliability than the REMO scale. From this, it can be concluded that the subscales of the REMO-U are a reliable measure when being applied to university students.

Further analyses explored the differences in subscale scores between both scales. A one-sample ttest was carried out on each of the five subscales, with statistically significant differences being shown on all of them. A statistically significant difference between the REMO scale and the REMO-U scale scores on the PPM factor was found, $t(151) = 8.42$, $p < .001$; $d = .67$, revealing a medium effect size. The REMO-U scale had a higher mean PPM score than the REMO PPM score. This suggests that university students were significantly more positively motivated by their peers than school pupils. There was also a statistically significant difference between the two scale scores on the PNM factor; $t(151) = 2.07$, $p = .040$; $d = .18$, showing a small effect size. The REMO-U scale had a higher mean PNM score than the REMO scale. A statistically significant difference was also found between

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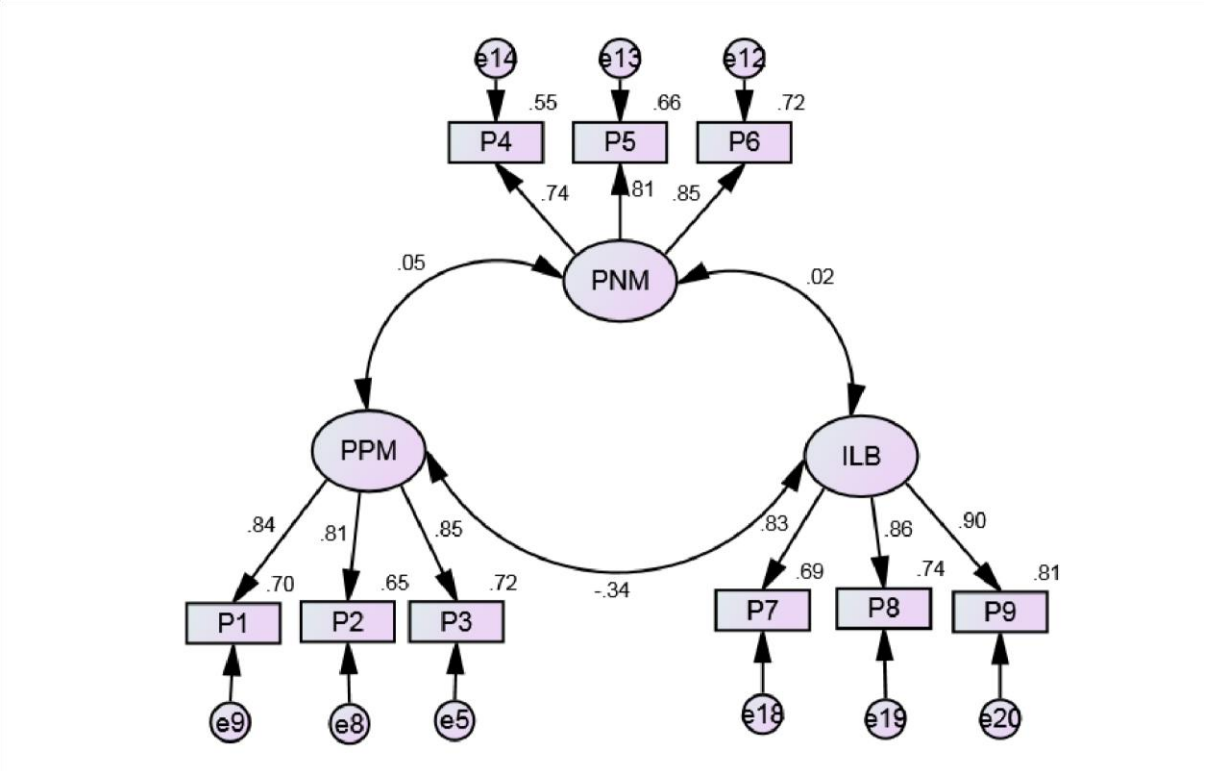
the REMO scale and the REMO-U scale scores of the ILB factor, t (151) = -2.04, p = .043; d = -.17, showing a small effect size. The REMO-U had a higher mean ILB score than the REMO scale, suggesting that university students engage in more individual learning than school pupils.

Confirmatory structural equation modelling for peer items was undertaken, wherein items were randomly assigned to three parcels each for the PPM, PNM and ILB factors (Raufelder et al., 2013a). The resulting Confirmatory Factor Analysis (CFA) showed a good fit to the data (χ^2 (24, n=180) = 26.19, p =.343, CFI = 0.997, RMSEA = 0.025, SRMR = 0.049), indicating the student data peer responses also fitted well to the Raufelder pupil model (Figure 3).

Figure 3: Confirmatory structural equation model for Peer items.



With regard to educators, a statistically significant difference was found between the LPM subscale score of the REMO-U and the TPM subscale score of the REMO (t (151) = 5.62, p < .001; d = 0.40), with the REMO-U scale having a higher score than the REMO. Despite a small effect size, this suggests that university students were more positively motivated by their lecturers/tutors than school pupils were by their teachers. A significant difference was also found on the LNM subscale score of the REMO-U and the TNM subscale score of the REMO, t (151) = 2.87, p = .005; d = .23, showing a small effect size. Once again, the REMO-U had a higher mean score on this subscale than the REMO, suggesting that university students are more negatively motivated by their lecturers and tutors than school pupils are by their teachers.

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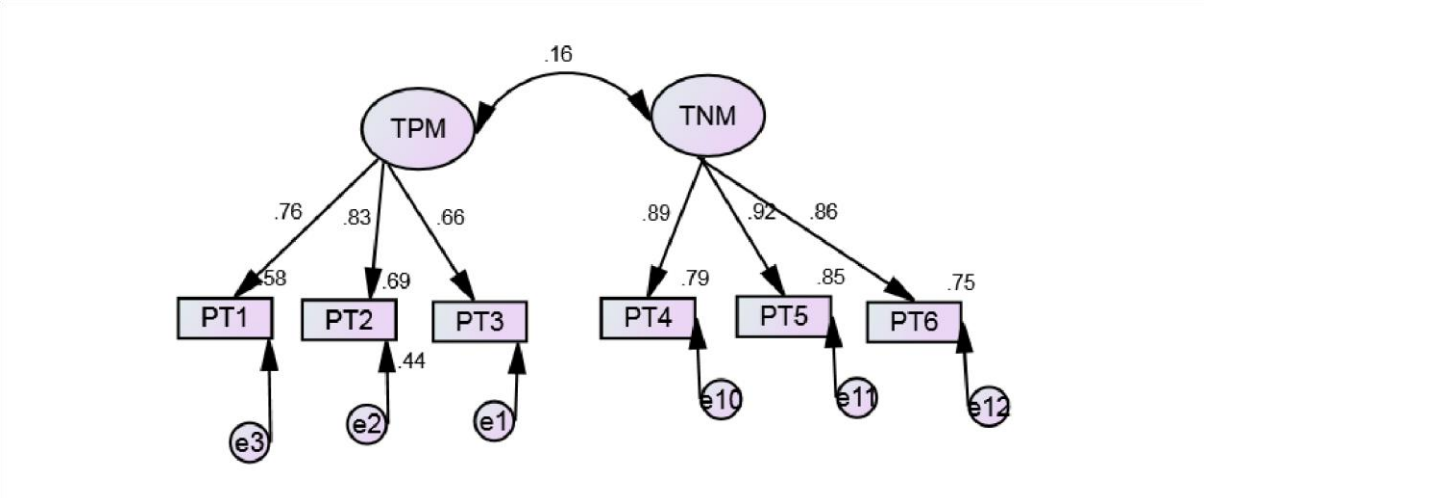
Confirmatory structural equation modelling was also conducted for Teacher items, wherein items were then randomly assigned to three parcels each for the TPM and TNM factors. The resulting CFA showed a good fit to the data (χ^2 (7, n=180) = 17.66, p = 0.024, CFI = 0.98, RMSEA = 0.09, SRMR = 0.062) indicating the student data teaching responses also fitted well to the Raufelder teacher model (Figure 4).

Figure 4: Confirmatory structural equation model for Teacher items.



A simple 2-tailed bivariate Pearson's correlation was performed on the five subscales of the REMO-U to investigate the pattern of inter-correlations. A positive correlation with a medium effect size was found between the LPM and the PPM subscale scores, r (152) = .37, p < .001. A positive correlation with a medium effect size was also found between the LNM and the PNM subscale scores, r (152) = .43, p < .001. This suggests that those university students who are positively motivated by their lecturers are also likely to perceive their peers as positive motivators too; however, those who are negatively motivated by their lecturers viewed their peers as negative motivators. A medium-sized negative correlation was found between the scores of the PPM subscale and the ILB subscale, r (152) = -0.30, p < .001. This could suggest that those who like to work on their own do not tend to view their peers as positive motivators, and those who perceive their peers as strong positive motivators are less likely to be internally motivated within themselves. No other correlations between the five subscale scores were found.

DISCUSSION

The REMO scale (Raufelder et al., 2013a) provides a strong foundation for the measurement of internal and external academic motivation in students, although adaptations were necessary in order to apply the scale to university students. Factor analyses confirmed that the REMO-U had largely the same structure as Raufelder and colleagues' REMO scale (2013a), supporting a threefactor solution for the peer items and a two-factor solution for the lecturer/tutor items. High internal consistencies of the five subscales of the REMO-U suggest a reliable measure, showing greater internal consistencies than the subscales of the REMO. The REMO-U also accounted

for a greater percentage of variance in scores of the P-REMO and the L-REMO scales compared to those of the REMO scale. This suggests that the adjustments made to the REMO to create the REMO-U scale allow recommendation for its use as a reliable and valid tool in measuring academic motivation. It should be noted that a sample of approximately 15% of the number of participants used in the REMO study was used in the current study, and in due course, confirmation of the findings reported here with a larger sample of university students would be helpful. In conclusion, the REMO-U allows assessment of university students' motivation and the manner in which this is positively or negatively influenced by their peers and educators. It also assists in determining the level to which students prefer to work individually or with others, and allows exploration of differences between school pupils and university students.

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