

## ORIGINAL ARTICLES

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# What Cannot Kill You Will Make You Stronger - Traumatization, Dreaming, And Performance In Public Examinations

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Some evidence has suggested that performance in examinations is facilitated by dreaming but is hampered by traumatization. This notion runs counter to the well-established evidence for the positive association between dreaming and traumatization. Therefore, the study presented here examined the extent to which the intensities of various types of traumatic and dream experiences could predict public examination outcomes while taking sex and mental health factors into consideration. The sample contained 564 Hong Kong upper secondary school graduates, whose academic performance was measured by the results of two public examinations for the admission to local upper secondary schools and universities. Participants' dream characteristics, severity of traumatic experiences, and psychopathological symptoms were assessed using the Dream Intensity Scale, Dream Motif Scale, Traumatic Experiences Checklist, and Ko's Mental Health Questionnaire, respectively. Overall, the weight of evidence was in favor of the theory that both dreaming and traumatization may enhance the examination performance of those students who are relatively good achievers. (**Sleep and Hypnosis 2015;17(1-2):1-10**)

**Key words:** Dream experiences, mental health, pathological personality, public examination performance, trauma

## INTRODUCTION

A sizeable number of studies (e.g., Busby, Lambert, & Ialongo, 2013; Hardaway, Larkby, & Cornelius, 2014; Henrich, Schwab-Stone, Fanti, Jones, & Ruchkin, 2004; Howard, Budge, & McKay, 2010; Ratner et al., 2006; Schwartz & Gorman, 2003; Thompson & Massat, 2005) have revealed that exposure to community violence – a type of traumatization

– is related to poor academic performance. This relationship appears to be indirect and is mediated by other factors, especially psychological distress (e.g., Rosenthal & Wilson, 2003; Schwartz & Gorman, 2003), aggression (e.g., Busby et al., 2013), and disruptive or delinquent behaviors (e.g., Hardaway et al., 2014; Schwartz & Gorman, 2003).

Dreams of taking or failing an examination are so common that they have long been conceived a typical dream theme (Freud, 1900; Griffith, Miyagi, & Tago, 1958; Nielsen et al., 2003; Schredl, Ciric, Götz, & Wittmann, 2004; Yu, 2008, 2009, 2010, 2011, 2012). Moreover, there is limited evidence that the phenomenological experience of dreaming is positively associated with performance in

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examinations (Arnulf et al., 2014; Yu, under review), even after personality traits and emotional attributes being controlled (Yu, under review). This finding can be more easily interpreted when it is considered that dreaming might facilitate daytime performance by rehearsing exigent events and working through related emotions. Accordingly, examination scenarios are frequently incorporated into the narrative content of dreams because they pose a significant threat to and even traumatize people. It is almost certain that traumatic experiences can increase dream salience and dream recall frequency (e.g., Cosman, 2013; Hartmann et al., 2001; Helminen & Punamäki, 2008; Najam et al., 2006; Punamäki, 1997; Valli et al., 2006). Yu (2014) demonstrated, furthermore, that people who have encountered more traumatizing events in their lives, especially those of the emotional type, tend to have more intense dream experiences.

The abovementioned findings converged in suggesting a triadic, reciprocal, yet paradoxical relationship between examination, traumatization, and dreaming. On the one hand, traumatization renders individuals more anxious, depressive, and violent, which in turn undermines their school performance. On the other hand, traumatization might intensify dream and threat–rehearsal experiences, thereby facilitating, rather than impeding, performance in examinations. A caveat, however, is that community violence exposure constitutes only one type of trauma. The scope of trauma can *ipso facto* be broadly defined to encompass all kinds of psychological sufferings, such as parentification, emotional neglect, and loss of significant ones. In a similar vein, trauma can be prolonged, repeated, and aggravated rather than a one–off episode, and reactions or resilience to trauma and the amount of support received from others most likely vary across individuals. The reconciliation between the two antithetical perspectives might hinge on the types of trauma suffered, the cumulative effects of lifetime traumatization, and the moderating effects of dream factors and psychopathological

symptoms. The study presented here attempted to test the extent to which public examination outcomes can be predicted by the intensities of various types of traumatic and dream experiences with consideration of mental health factors, such as ego strength, depression, and antisocial symptoms.

## METHOD

### Participants

The sample was made up of 176 (31.2%) male and 388 (68.8%) female participants, who undertook the Hong Kong Advanced Level Examination in the same year when this study was conducted. The average age was 19.28 (range=17–25, SD=1.204).

### Instruments

Subjective intensity of dream experiences and tendencies to dream particular sets of themes were assessed using the Dream Intensity Scale (DIS) and Dream Motif Scale (DMS), respectively. Academic performance scores were computed based on the results of two public examinations that local upper secondary schools and universities employed to select students for admission. In addition to the measures of dream experiences and examination performance, Traumatic Experiences Checklist (TEC) and Ko's Mental Health Questionnaire (KMHQ) were used to assess participants' severity of traumatic experiences, ego functions, and psychopathological symptoms.

*DIS.* The DIS (Yu, 2012b) assesses the cognitive representation of the aggregate magnitude of sleep–state mentation by summarizing a wide range of dream–related activities into four main factors: Dream Quantity, Dream Vividness, Diffusion, and Altered Dream Episodes. The Dream Quantity scale comprises variables that measure the quantitative aspect of regular dream activities shared by most people, for example, the frequencies of dream awareness, recalling the main content of dreams, and

nightmares. The Major Modalities subscale measures the frequencies of visual, auditory, and emotional experiences during dreaming. The psychometric properties of the DIS are available in Yu's (2008b, 2009a, 2010a, 2012b) previous reports.

**DMS.** The DMS (Yu, 2012a) evaluates the intrinsic predispositions that modulate the formation of dream narratives. It consists of 100 dream themes, various combinations of which constitute 14 scales, each measuring a dream predisposition. For example, themes of the Ego Ideal scale are concerned with issues surrounding dreamers' falling short of social expectations, such as "failing an examination" and "failing or performing very badly in front of others (e.g., teachers, classmates, bosses, colleagues, etc.)." Of the 100 DMS items, eight depicted themes directly relating to schooling: Items 16 ("having superior knowledge or mental ability"), 27 ("school, teachers, and studying"), 34 ("failing an examination"), 65 ("failing or performing very badly in front of others (e.g., teachers, classmates, bosses, colleagues, etc.)"), 66 ("others not giving you proper credit for your achievements"), 74 ("reuniting with a long-lost schoolmate"), 92 ("being absent from classes or examinations"), and 99 ("rolling out of bed, cleaning up, going to school or work"). The psychometric properties of the DMS are available in Yu's (2009b, 2010b, 2012a) previous reports.

**TEC.** The TEC (Nijenhuis, Van der Hart, & Kruger, 2002) evaluates 29 types and three major categories of potentially traumatic events that may happen to both children and adults: emotional trauma, bodily threat, and sexual trauma (see Table 1). A severity score can be calculated for each type and each category based on four indicators: 1) presence of the event, 2) age of onset, 3) duration of trauma, and 4) the degree of impact that the respondent subjectively feels. In addition to these four indicators, the TEC also inquires about the level of support received for each traumatic event. In this study, the total number of trauma types and the total trauma severity score were calculated using all 29 item scores.

**Table 1: Classification of Traumatic Experiences**

<b>TEC categories and types</b>
<b>Emotional trauma</b>
Emotional neglect
14 <i>Emotional neglect by member of family of origin</i>
15 <i>Emotional neglect by other family member</i>
16 <i>Emotional neglect by nonfamily member</i>
Emotional abuse
17 <i>Emotional abuse by member of family of origin</i>
18 <i>Emotional abuse by other family member</i>
19 <i>Emotional abuse by nonfamily member</i>
<b>Bodily threat</b>
Physical abuse
20 <i>Physical abuse by member of family of origin</i>
21 <i>Physical abuse by other family member</i>
22 <i>Physical abuse by nonfamily member</i>
Other bodily threat items
9 <i>Deliberate threat to life from another person, e.g., during crime</i>
10 <i>Intense pain from illness, medical treatment, etc.</i>
23 <i>Bizarre punishment</i>
<b>Sexual trauma</b>
Sexual harassment
24 <i>Sexual harassment by member of family of origin</i>
25 <i>Sexual harassment by other family member</i>
26 <i>Sexual harassment by nonfamily member</i>
Sexual abuse
27 <i>Sexual abuse by member of family of origin</i>
28 <i>Sexual abuse by other family member</i>
29 <i>Sexual abuse by nonfamily member</i>
<b>Other trauma types</b>
1 <i>Parentification</i>
2 <i>Family problems</i>
3 <i>Loss of a family member in childhood</i>
4 <i>Loss of own child or partner in adulthood</i>
5 <i>Severe bodily injury</i>
7 <i>Threat to life from illness, surgery, accident, torture</i>
7 <i>Divorced parents</i>
8 <i>Own divorce</i>
11 <i>War experience</i>
12 <i>Second generation war victim</i>
13 <i>Witnessing others undergo trauma</i>

**KMHQ.** The KMHQ (Ko, 1998), which contains 300 statements and 38 scales, is a comprehensive assessment for a person's mental health status. Participants rated the degree to which each statement could apply to them on a 6-point scale (1=*not at all true* to 6=*completely true*). The KMHQ assesses both positive mental health factors and pathological tendencies, such as gregariousness, empathy, independence, ego strength, impression management/social desirability, neuroticism, psychoticism, depression, anxiety, obsessive compulsion, somatoform features, antisocial personality, passive-aggressive personality, borderline personality, and narcissism. Most of the

pathological scales comprise items depicting some classical symptoms of the respective disorders. The obsessive-compulsion scale, for instance, comprises items evaluating symptoms of obsessive-compulsive disorder – such as unjustified concerns about contamination and excessive hand washing, ordering, and repetitive behaviors – and those of obsessive-compulsive personality disorder, such as preoccupation with rules and perfectionism.

*Public Examination Results.* Hong Kong Certificate of Education Examination (HKCEE) and Hong Kong Advanced Level Examination (HKALE)/Hong Kong Advanced Supplementary Level Examination (HKASLE) indicated participants' academic performance in the first five secondary school years and that in the recent two upper secondary school years, respectively. All examination grades were converted into points for the computation of performance scores (A=5, B=4, C=3, D=2, E=1, and F=0). Two total scores were calculated in accordance with the local admission requirements for upper secondary school and university studies:

1. HKCEE standard total score (Chinese Language + English Language + sum of the best four other subjects)
2. HKALE standard total score (Chinese Language and Culture + Use of English + one Advanced Level (AL) subject with the highest grade or 0.5 x sum of the best two Advanced Supplementary Level (ASL) subjects)

Additionally, the following scores were computed in an attempt to diversify the assessment method for participants' academic performance:

1. HKCEE alternative total score (Chinese Language + English Language + Mathematics + sum of the best three other subjects)
2. HKALE alternative total score 1 (0.5 x (Chinese Language and Culture + Use of English) + the best AL subject or 0.5 x sum of the best two ASL subjects)
3. HKALE alternative total score 2 (one of the three following equations that could result

in the highest score was chosen for each participant: sum of the best two AL subjects, 0.5 x sum of the best four ASL subjects, or the best AL subject + 0.5 x (Chinese Language and Culture + Use of English))

4. HKCEE language score (Chinese Language + English Language)
5. HKALE language score (Chinese Language and Culture + Use of English)
6. Combined HKCEE and HKALE language score (HKCEE language score + HKALE language score)
7. Number of subjects attempted in the HKCEE
8. Number of passed subjects in the HKCEE
9. Number of subjects attempted in the HKALE
10. Number of passed subjects in the HKALE

## RESULTS

The HKCEE standard and alternative total scores were significantly correlated with all the HKALE standard total and alternative scores, the correlation between the HKCEE standard total score and the HKALE standard total score being the strongest,  $r_s=0.318$ ,  $p<.001$ . All three language scores for females were significant higher than those for males: the HKCEE language score,  $z=4.158$ ,  $p<.001$ , Cohen's  $d=0.398$ , the HKALE language score,  $z=3.233$ ,  $p<.01$ , Cohen's  $d=0.314$ , and the combined language score,  $z=3.488$ ,  $p<.001$ , Cohen's  $d=0.379$ . No other sex differences in public examination scores were found.

### Correlations between Examination Outcomes and Dream Variables

The HKALE scores did not have any notable associations with any dream scales, except the correlations of the HKALE alternative total score 1,  $r_s=0.106$ ,  $p<.05$ , and HKALE alternative total score 2,  $r_s=0.115$ ,  $p<.01$ , with the DMS Sensorimotor scale. On the other hand, both the HKCEE standard and alternative total scores displayed significant correlations with many dream variables: the DIS Paramnesia ( $r_s=0.136$ ,

$p < .01$ ;  $r_s = 0.136$ ,  $p < .01$ ), DMS Delusion ( $r_s = 0.115$ ,  $p < .01$ ;  $r_s = 0.109$ ,  $p < .05$ ), Ego Ideal ( $r_s = 0.136$ ,  $p < .01$ ;  $r_s = 0.132$ ,  $p < .01$ ), Persecution ( $r_s = 0.108$ ,  $p < .05$ ;  $r_s = 0.109$ ,  $p < .05$ ), Paranoia ( $r_s = 0.117$ ,  $p < .01$ ;  $r_s = 0.112$ ,  $p < .05$ ), Erotomania ( $r_s = 0.109$ ,  $p < .05$ ;  $r_s = 0.105$ ,  $p < .05$ ), Sensorimotor ( $r_s = 0.100$ ,  $p < .05$ ;  $r_s = 0.101$ ,  $p < .05$ ), and Convenient Dreaming scales ( $r_s = 0.112$ ,  $p < .05$ ;  $r_s = 0.110$ ,  $p < .05$ ) and Items 27 (“school, teachers, and studying”;  $r_s = 0.121$ ,  $p < .01$ ;  $r_s = 0.118$ ,  $p < .01$ ) and 65 (“failing or performing very badly in front of others (e.g., teachers, classmates, bosses, colleagues, etc.)”;  $r_s = 0.162$ ,  $p < .001$ ;  $r_s = 0.157$ ,  $p < .001$ ) of the Ego Ideal scale.

The combined language score was significantly correlated with the DIS global,  $r_s = 0.108$ ,  $p < .05$ , Dream Quantity,  $r_s = 0.127$ ,  $p < .01$ , Regular Dreams,  $r_s = 0.124$ ,  $p < .01$ , and Major Modalities scores,  $r_s = 0.104$ ,  $p < .05$ . The significance of these correlations was mostly contributed by the more robust correlations of the HKCEE language score with the DIS factors: DIS global,  $r_s = 0.134$ ,  $p < .01$ , Dream Quantity,  $r_s = 0.161$ ,  $p < .001$ , Regular Dreams,  $r_s = 0.163$ ,  $p < .001$ , Major Modalities,  $r_s = 0.154$ ,  $p < .001$ , Dream Vividness,  $r_s = 0.124$ ,  $p < .01$ , and Paramnesia,  $r_s = 0.101$ ,  $p < .05$ .

### **Correlations between Examination Outcomes and Trauma Factors**

The number of passed subjects in the HKCEE was negatively correlated with the total number of types of trauma experienced,  $r_s = -0.126$ ,  $p < .01$ , TEC total severity score,  $r_s = -0.126$ ,  $p < .01$ , and bodily threat severity score,  $r_s = -0.120$ ,  $p < .01$ . However, both the HKCEE standard and alternative total scores did not have significant associations with any TEC scales. The TEC bodily threat and physical abuse severity scores were negatively correlated with the combined language score ( $r_s = -0.117$ ,  $p < .01$ ;  $r_s = -0.109$ ,  $p < .05$ ) and the HKALE language score ( $r_s = -0.109$ ,  $p < .05$ ;  $r_s = -0.105$ ,  $p < .05$ ), their correlations with the HKCEE language score being marginal ( $r_s = -0.091$ ,  $p < .05$ ;  $r_s = -0.088$ ,  $p < .05$ ). The combined

language score also showed a negative correlation with the amount of support received after a bodily threat,  $r_s = -0.099$ ,  $p < .05$ .

### **Correlations between Examination Outcomes and Mental Health Factors**

Both the HKCEE standard and alternative total scores exhibited a significant correlation with the KMHQ Narcissism scale ( $r_s = 0.130$ ,  $p < .01$ ;  $r_s = 0.124$ ,  $p < .01$ ). The combined language score was correlated negatively with the KMHQ Obsessive Compulsion scale,  $r_s = -0.107$ ,  $p < .05$ , and positively with the KMHQ Empathy,  $r_s = 0.119$ ,  $p < .01$ , and Normal Femininity scales,  $r_s = 0.131$ ,  $p < .01$ . Similarly, the HKCEE language score was correlated with the Normal Femininity scale,  $r_s = 0.119$ ,  $p < .01$ . No other significant correlations between the examination scores and KMHQ scales were found.

### **Multiple Linear Regression Analyses for Predicting Examination Outcomes**

With the exception of the HKCEE standard and alternative total scores, all other public examination scores showed a very narrow range of values, an unusually high percentage of the mode value, and positive skewness (see Table 2). Given these normative characteristics and the correlation patterns reported above, stepwise regression analyses were performed using only the HKCEE standard total score and the combined language score. The resultant regression models are presented in Table 3. DMS Theme 65, rather than the DIS Paramnesia subscale, was included in the regression model when two DMS themes, in lieu of the DMS Ego Ideal scale, were entered into the analysis for the HKCEE standard score. The DIS Dream Quantity scale was a significant predictor in the model for the combined language score. Although the TEC severity and support scores for bodily threat were significant correlates of the combined language score, they were eliminated by the regression analysis when dream and other factors were taken into account.

**Table 2: Descriptive Statistics of Examination Scores**

	Mean	SD	Skewness	Range	Mode	% of mode
HKCEE standard total score	15.10	2.904	-.074	6-23	15	15.0
HKALE standard total score	5.17	1.406	.503	2-10	5	30.6
HKCEE alternative total score	15.04	2.917	-.077	6-23	14	15.0
HKALE alternative total score 1	3.46	0.959	.369	1-7	3.5	23.8
HKALE alternative total score 2	3.55	1.009	.302	1-7	4	21.4
HKCEE language score	4.90	1.304	.230	1-9	4	29.0
HKALE language score	3.43	1.145	.821	1-8	3	38.9
Combined HKCEE and HKALE language score	8.42	2.046	.619	4-15	8	21.0

**Table 3: Beta Coefficients of Stepwise Linear Regression Models**

	HKCEE standard score (Model 1)	HKCEE standard score (Model 2)	Combined language score
Regression solutions	F=6.574, p<.01, R <sup>2</sup> =0.025	F=7.541, p<.001, R <sup>2</sup> =0.029	F=7.989, p<.001, R <sup>2</sup> =0.062
TEC bodily threat			s
TEC amount of support received after bodily threats			s
KMHQ narcissism	0.093*	0.102*	
KMHQ obsessive compulsion			-0.133**
KMHQ empathy			s
KMHQ normal femininity			0.098*
Sex			0.118*
DIS Dream Quantity			0.130**
DIS Major Modalities			s
DIS Paramnesia	0.103*	s	
DMS Ego Ideal	s		
DMS Convenient Dreaming	s	s	
DMS Theme 27 ("school, teachers, and studying")		s	
DMS Theme 65 ("failing or performing very badly in front of others (e.g., teachers, classmates, bosses, colleagues, etc.))		0.117**	

Note. s= significant correlate that was entered into but was eliminated by regression analysis. \*= t-test significant level <.05, \*\*= t-test significant level <.01

### Comparisons between High and Average HKALE Achievers

The sample was divided into two groups using the standard HKALE total score of 7.5 as a cutoff point, which was approximately equivalent to the average of Grade C: the group made up of participants with a standard HKALE total score of 7.5 or above (6%) and the group made up of the remaining participants (94%). The high HKALE achieving group scored significantly higher in the HKCEE standard total scale,  $z=3.774$ ,  $p<.001$ , Cohen's  $d=0.774$ , HKCEE alternative total scale,  $z=3.629$ ,  $p<.001$ , Cohen's  $d=0.746$ , and HKCEE language scale,  $z=5.645$ ,  $p<.001$ , Cohen's  $d=1.176$ , than did the remaining participants. There was a trend that females was more likely to be categorized into the high achieving group, Pearson Chi-Square=3.607,  $p=.058$ , Phi=.083.

The high HKALE achieving group reported a greater number of trauma types,  $z=2.119$ ,  $p<.05$ , Cohen's  $d=0.391$ , and a larger TEC total severity score,  $z=2.052$ ,  $p<.05$ , Cohen's  $d=0.340$ , as compared with the other participants. Specifically, they rated significantly higher in the severity level for Item 13, witnessing others undergo trauma,  $z=2.319$ ,  $p<.05$ , Cohen's  $d=0.417$ , Item 14, emotional neglect by member of family of origin,  $z=2.487$ ,  $p<.05$ , Cohen's  $d=0.346$ , and Item 22, physical abuse by nonfamily member,  $z=3.694$ ,  $p<.001$ , Cohen's  $d=0.302$ . However, the differences for all major TEC scale scores (e.g., emotional trauma, physical trauma, sexual trauma) were not significant. Only three of the 38 KMHQ scales showed a between-group difference: Impression Management,  $z=2.422$ ,  $p<.05$ , Cohen's  $d=-0.348$ , Passive Aggression,  $z=2.519$ ,  $p<.001$ , Cohen's  $d=0.476$ , Obsessive Compulsion,  $z=2.359$ ,  $p<.05$ , Cohen's  $d=-0.442$ .

The high achieving group scored higher across all dream scales than did the remaining participants. The difference for 15 dream factors reached the significance level: the DIS global scale,  $z=2.173$ ,  $p<.05$ , Cohen's  $d=0.399$ , Dream Quantity scale,  $z=2.575$ ,  $p<.05$ , Cohen's  $d=0.436$ , Regular Dreams subscale,  $z=2.238$ ,  $p<.05$ , Cohen's  $d=0.386$ , Bad Dreams subscale,  $z=2.077$ ,  $p<.05$ , Cohen's  $d=0.345$ , DMS Delusion,  $z=2.719$ ,  $p<.01$ , Cohen's  $d=0.397$ , Ego Ideal,  $z=2.397$ ,  $p<.05$ , Cohen's  $d=0.395$ , Grandiosity,  $z=2.134$ ,  $p<.05$ , Cohen's  $d=0.278$ , Persecution,  $z=2.076$ ,  $p<.05$ , Cohen's  $d=0.312$ , Paranoia,  $z=2.241$ ,  $p<.05$ , Cohen's  $d=0.374$ , Sensorimotor Excitement,  $z=2.270$ ,  $p<.05$ , Cohen's  $d=0.364$ , Animal Symbolism,  $z=2.774$ ,  $p<.01$ , Cohen's  $d=0.458$ , Unusual Creature,  $z=2.680$ ,  $p<.01$ ,

Cohen's  $d=0.258$ , Object Relation scales,  $z=2.040$ ,  $p<.05$ , Cohen's  $d=0.334$ , DMS Item 65 ("failing or performing very badly in front of others (e.g., teachers, classmates, bosses, colleagues, etc.)"),  $z=2.267$ ,  $p<.05$ , Cohen's  $d=0.399$ , and DMS Item 66 ("others not giving you proper credit for your achievements"),  $z=3.154$ ,  $p<.01$ , Cohen's  $d=0.543$ .

### Logistic Regression Analyses for Predicting Examination Outcomes

The logistic regression analyses of all significant factors indicated that high HKALE achievers could be distinguished from the remaining sample by their larger number of trauma types experienced, more frequently

**Table 4: Odds Ratios (Exp(B)) of Forward LR Stepwise Logistic Regression Models for Distinguishing High HKALE Achievers from Other Participants**

	Model 1	Model 2	Model 3
Regression solutions	Chi-square=33.438, p<.001	Chi-square=33.328, p<.001	Chi-square=51.090, p<.001
TEC number of trauma types	1.201*		1.198*
TEC total severity score	s		s
TEC severity score for Item 13, witnessing others undergo trauma		1.500*	s
TEC severity score for Item 14, emotional neglect by member of family of origin		s	s
TEC severity score for Item 22, physical abuse by nonfamily member		s	s
HKCEE standard total score			s
HKCEE language score			2.296***
Sex	0.264*	0.273*	s
KMHQ impression management	s	s	s
KMHQ passive aggression	1.120**	1.110**	1.085*
KMHQ obsessive compulsion	0.885**	0.892**	0.889*
DIS total	s	s	s
DIS Dream Quantity	s	s	s
DIS Regular Dreams	s	s	s
DIS Bad Dreams	s	s	s
DMS Delusion	s	s	s
DMS Ego Ideal	s	s	s
DMS Grandiosity	s	s	s
DMS Persecution	s	s	s
DMS Paranoia	s	s	s
DMS Sensorimotor Excitement	s	s	s
DMS Animal Symbolism	s	s	s
DMS Unusual Creature	s	s	s
DMS Object Relation			
DMS Theme 65 ("failing or performing very badly in front of others (e.g., teachers, classmates, bosses, colleagues, etc.)")	s	s	s
DMS Theme 66 ("others not giving you proper credit for your achievements")	1.681**	1.683**	1.546*

Note. s= significant correlate that was entered into but was removed by regression analysis. \*= Wald test significant level <.05, \*\*= Wald test significant level <.01, \*\*\*= Wald test significant level <.001.

dreaming of “others not giving you proper credit for your achievements,” better HKCEE language results, stronger passive–aggressive personality, and less robust obsessive–compulsive symptoms (see Table 4). The odds ratio for the dream factor was larger than those for the trauma and psychopathological factors in all logistic regression models.

## DISCUSSION

Traumatization is known to cause intense dream experiences, which, according to the recent findings reported by Arnulf et al. (2014) and Yu (under review), predict better performance in examinations. This occurs despite the substantial evidence that exposure to violence jeopardizes psychological being and school performance. In light of these two contradictory propositions derived from the literature, the study presented here was geared toward comparing the effects of various traumatic and dream experiences on public examination outcomes with consideration of participants’ mental health status. Although the TEC bodily threat severity was found to inversely vary with the aggregated language examination score, its predictive value was overridden by dream and mental health variables in the regression analysis. Accordingly, the negative relationship between traumatization and examination performance was most probably mediated by other factors.

In stark contrast to the linear correlation and regression analyses, the results for the comparisons between the good achievers in the HKALE and the average students were more consistent. As indicated by their markedly larger scores across the TEC, DIS, and DMS scales, the good HKALE achievers experienced more severe lifetime traumatization and more intense dream activities did the average students. The logistic regression analyses unveiled, furthermore, that a greater number of trauma types encountered or a larger severity score for witnessing others undergo trauma, together with a higher frequency of dreaming about one’s achievements

being undervalued, could significantly distinguish the high HKALE achievers from the remaining sample. This held true even after taking into account all other critical factors, such as sex, previous examination results, impression management, passive–aggressive features, and obsessive–compulsive symptoms. The comparison of the odds ratio and Cohen’s *d* values suggested that the positive effect of dream intensity on examination performance was stronger than that of traumatization severity. For instance, the Cohen’s *d* for the DIS global score was 0.399, compared with 0.340 for the TEC total severity score.

Taken together, it appears that traumatic events and in particular bodily threats and physical abuse can adversely influence some aspects of examination performance, yet under certain circumstances, traumatization of a vicarious type – that is, witnessing other undergo trauma – can improve performance. There are several possible explanations for the latter effect. First, vicarious traumatization might, as reflected by its concomitant increase in performance–anxiety and ego–ideal dreams, motivate some people to excel in examinations. Second, traumatizing events might mobilize a person’s dream and coping mechanisms, which in turn facilitate performance. Third, good performing students report more traumatic and dream experiences because they are less defensive against disclosure. Nonetheless, the third explanation is improbable in view of the finding that dream and TEC factors were still significantly predictive of examination scores, even with the effect of impression management being controlled.

The overall evidence suggests that the significance for the association between traumatization and examination performance somewhat hinges on the sensitivity of the measures and the normative characteristics of the sample. Specifically, the narrow range and positive skewness of the HKALE scores rendered the connection between the HKALE and TEC scores more detectable by group comparison tests than by linear relationship tests. Moreover,



all participants in the present sample completed upper secondary school education; in other words, they were relatively good achievers in comparison with those students who failed to enter upper secondary schools. This argument resonates with the finding that narcissism could predict better performance in the HKCEE. It should be noted, therefore, that there are at

least two reasons for any non-significant finding presented here: 1) the relationship does not exist and 2) the relationship cannot be captured by the chosen samples, measures, or statistical tests. To provide a more complete picture of how traumatic and dream experiences influence school performance, future studies may target on underprivileged students' learning.

## REFERENCES

1. Arnulf I, Grosliere L, Le Corvec T, Golmard JL, Lascols O, Duguet A. Will students pass a competitive exam that they failed in their dreams? *Consciousness Cogn* 2014;29:36-47.
2. Busby DR, Lambert SF, Ialongo NS. Psychological symptoms linking exposure to community violence and academic functioning in African American adolescents. *Journal of Youth and Adolescence* 2013;42:250-262.
3. Cosman I. Remembering the Holocaust: Dreams during and after a long traumatic experience. *Philobiblon: Transylvanian Journal of Multidisciplinary Research in Humanities*, 18;116-126.
4. Freud S. The interpretation of dreams. In: J Strachey, ed. *The standard edition of the complete works of Sigmund Freud*. London, England: Hogarth Press, 1900;1-627.
5. Griffith RM, Miyagi O, Tago A. Universality of typical dreams: Japanese vs. Americans. *American Anthropologist* 1958;60:1173-1179.
6. Hardaway CR, Larkby CA, Cornelius MD. Socioemotional adjustment as a mediator of the association between exposure to community violence and academic performance in low-income adolescents. *Psychology of Violence* 2014; 4;281-293.
7. Hartmann E, Zborowski M, Rosen R, Grace N. Contextualizing images in dreams: More intense after abuse and trauma. *Dreaming* 2001;11:115-126.
8. Helminen E, Punamäki RL. Contextualized emotional images in children's dreams: Psychological adjustment in conditions of military trauma. *International Journal of Behavioral Development* 2008;32:177-187.
9. Henrich CC, Schwab-Stone M, Fanti K, Jones SM, Ruchkin V. The association of community violence exposure with middle-school achievement: A prospective study. *Journal of Applied Developmental Psychology* 2004;25:327-348.
10. Howard KAS, Budge SL, McKay KM. Youth exposed to violence: The role of protective factors. *Journal of Community Psychology* 2010;38:63-79.
11. Ko YH. *Ko's Mental Health Questionnaire (KMHQ)*. Taipei, Taiwan: Chinese Behavioral Science Corporation, 1998.
12. Najam N, Mansoor A, Kanwal RH, Naz S. Dream content: Reflections of the emotional and psychological states of earthquake survivors. *Dreaming* 2006;16:237-245.
13. Nielsen TA, Zadra AL, Simard V, Saucier S, Stenstrom P, Smith C, Kuiken D. The typical dreams of Canadian university students. *Dreaming* 200;13:211-235.
14. Nijenhuis ERS, Van der Hart O, Kruger K. The Psychometric characteristics of the traumatic experiences checklist (TEC): First findings among psychiatric outpatients. *Clinical Psychology and Psychotherapy* 2002;9:200-210.
15. Punamäki RL. Determinants and mental health effects of dream recall among children living in traumatic conditions. *Dreaming* 1997;7:235-263.
16. Ratner HH, Chiodo L, Covington C, Sokol RJ, Ager J, Delaney-Black V. Violence exposure, IQ, academic performance, and children's perception of safety: Evidence of protective effects. *Merrill-Palmer Quarterly* 2006;52:264-287.
17. Rosenthal B, Wilson W. Impact of exposure to community violence and psychological symptoms on college performance among students of color. *Adolescence* 2003;38:239-249.
18. Schredl M, Ciric P, Götz S, Wittmann L. Typical dreams: Stability and gender differences. *Journal of Psychology* 2004;138:485-494.
19. Schwartz D, Gorman AH. Community violence exposure and children's academic functioning. *Journal of Educational Psychology* 2003;95:163-173.
20. Thompson T, Massat CR. Experiences of violence, posttraumatic stress, academic achievement and behavior problems of urban African-American children. *Child and Adolescent Social Work Journal* 2005;22:367-393.
21. Valli K, Revonsuo A, Pälkäs O, Punamäki RL. The effect of trauma on dream content — A field study of Palestinian children. *Dreaming* 2006;16:63-87.
22. Yu CKC. Typical dreams experienced by Chinese people. *Dreaming e.g.*, 2008a, 2008b, 2009a, 2009b, etc.;18:1-10.

23. Yu CKC. *Dream Intensity Inventory and Chinese people's dream experience frequencies*. *Dreaming* 2008;18:94-111.
24. Yu CKC. *Confirming the factor structure of the Dream Intensity Inventory*. *Dreaming* 2009;19:97-107.
25. Yu CKC. *Paranoia in dreams and the classification of typical dreams*. *Dreaming* 2009;19:255-272.
26. Yu CKC. *Dream Intensity Scale: Factors in the phenomenological analysis of dreams*. *Dreaming* 2010;20:107-129.
27. Yu CKC. *Recurrence of typical dreams and the instinctual and delusional predispositions of dreams*. *Dreaming* 2010;20:254-279.
28. Yu CKC. *The constancy of typical dreams*. *Asia Pacific Journal of Counselling and Psychotherapy* 2011;2:51-70.
29. Yu CKC. *Dream Motif Scale*. *Dreaming* 2012;22:18-52.
30. Yu CKC. *Testing the factorial structure of the Dream Intensity Scale*. *Dreaming* 2012;22:284-309.
31. Yu CKC. *Psychopathological symptoms as a function of trauma, dreams, and inhibitions*. *Dreaming* 2014;24:309-322.
32. Yu CKC. (under review). *Can students' dream experiences predict their performance in public examinations?*