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Introducing the Francis Owl-Lark Indices (FOLI): Assessing the implications of diurnal  
activity patterns for clergy work-related psychological health

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### **Abstract**

Drawing on data provided by 338 clergy serving in the Church in Wales this study reports the development of a 14-item instrument designed to provide independent measures of preference for morning activity (the Lark preference) and preference for evening activity (the Owl preference) appropriate for use among clergy. The thesis is then tested that these preferences predict individual differences in clergy work-related psychological health, as assessed by the Francis Burnout Inventory, after taking into account the effects of sex and personality (extraversion and neuroticism). The data demonstrated that clergy who displayed the Lark preference for mornings were less likely to suffer from burnout. Clergy who displayed the Owl preference for evenings were neither more nor less likely to suffer from burnout. Although significantly correlated the two preference measures are related differently to individual differences in levels of burnout.

*Keywords:* morningness, eveningness, personality, burnout, clergy

## Introduction

A growing research literature has drawn attention to the personal and social significance of individual differences in preferences for morning activity (the Lark preference) and for evening activity (the Owl preference). Within this literature the contrast between ‘morningness’ and ‘eveningness’ refers to individual differences ‘in circadian phase position of sleep-wake and subjective alertness rhythms’ (Arrona-Palacios & Díaz-Morales, 2017, p. 480). Morningness and eveningness are not regarded as opposite poles of a single continuum, but an independent (although not orthogonal) factors, with the consequence that individuals can be classified as morning types, evening types, or neither types. In general Larks prefer waking up early and tend to feel at their best during the morning, while Owls prefer waking up later in the day and tend to feel at their best in the late afternoon.

Preferences for morningness and eveningness (the diurnal rhythm) have been assessed by a range of measures, including: the 19-item Morningness-Eveningness Questionnaire (MEQ; Horne & Östberg, 1976); the 7-item Diurnal Type Scale (DTS; Torsvall, & Åkerstedt, 1980); the 13-item Composite Scale of Morningness (CSM; Smith, Reilly, & Midkiff, 1989); the 5-item Reduced Morningness-Eveningness Questionnaire (rMEQ; Adan & Almirall, 1990); the ten-item Morningness-Eveningness Scale for Children (MESFC; Carskadon, Vieira, & Acebo, 1993); and the 12-item Early-Late Preferences Scale (Smith, et al., 2002).

The connections between the Lark and the Owl preferences and personality have been explored in relation to several models of personality. For example, a number of earlier studies located morningness and eveningness preferences alongside the two dimensional model of personality (extraversion and neuroticism) proposed by Eysenck and Eysenck (1964) and the later three dimensional model (extraversion, neuroticism, and psychoticism) proposed by Eysenck and Eysenck (1975), including work reported by Eysenck and Folkard (1980), Humphreys, Revelle, Simon, and Gilliland (1980), Larsen (1985), Mecacci, Zani, Rochetti,

and Luciola (1986), Mura and Levy (1986), Matthews (1987), Zuber and Ekehammar (1988), Wilson (1990), Adan and Almiral (1990, 1991), Neubauer (1992), Adan (1992, 1994), Mitchell and Redman (1993), Mecacci and Rocchetti (1998), Langford and Glendon (2002), Francis, Fearn, and Booker (2003), Mecacci, Righi, & Rocchetti (2004).

While evidence from these studies is far from unanimous, the main clue to emerge is that impulsivity is the key personality factor to predict the preferred time of day (Anderson & Revelle, 1982, 1994), although even here the evidence is not conclusive. Some studies have failed to find a significant relationship between impulsivity and the diurnal rhythm (Lawrence & Stanford, 1999). In respect of Eysenck's dimensional model of personality, the location of impulsivity within personality has itself been somewhat problematic. In the early Eysenck Personality Inventory (Eysenck & Eysenck, 1964) impulsivity was associated with extraversion. In the more recent Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975) and the Revised Eysenck Personality Questionnaire (Eysenck & Eysenck, 1991), impulsivity was associated with psychoticism. Studies, however, have reported significant correlations between the diurnal rhythm and Eysenck's more recent conceptualisation of extraversion, particularly a relationship between extraversion and eveningness (Larsen, 1985; Adan, 1992; Mitchell & Redman, 1993) and the neuroticism scale, indicating a relationship between neuroticism and eveningness (Mura & Levy, 1986; Neubauer, 1992; Mecacci & Rocchetti, 1998).

More recent studies have located morningness and eveningness preferences alongside the Big Five Factor model of personality (extraversion, neuroticism, agreeableness, conscientiousness, and openness) as proposed by Costa and McCrae (1985), including work reported by Jackson and Gerard (1996), Gray and Watson (2002), Zelenski, Rusting, and Larsen (2003), Dresch, Sánchez-López, and Aparicio-García (2005), DeYoung, et al. (2007), Cavallera and Giampietro (2007), Hogben, Ellis, Archer, and von Schantz (2007), Díaz-

Morales (2007), Randler (2008a), Tonetti, Fabbri, and Natale (2009), Randler, Baumann, and Horzum (2014), Walker, et al. (2014), Walker, Christopher, Wieth, and Buchanan (2015), and Ponzi, et al. (2015). These studies tend to suggest that Larks record higher scores on agreeableness and conscientiousness, but lower scores on neuroticism.

A number of studies have also noted and reported on sex differences among Larks and Owls. For example, using the 19-item Morning-Eveningness Questionnaire (Horne & Östberg, 1976) among a sample of 2,135 students (with an age range from 18 to 30 years), Adan and Natale (2002) reported that men presented a more pronounced eveningness preference. Subsequently, drawing on a meta analysis of 52 studies, Randler (2007) concluded that females were significantly more morning orientated than males.

Studies concerned with the health-related correlates (both physical and psychological) of the diurnal rhythm have generally pointed to a better trajectory among Larks. For example, Larks show better general health (Paine, Gander, & Travier, 2006), lower incidence of depression (Mecacci & Rocchetti, 1998; Chelminski, Ferraro, Petros, & Plaud, 1999; Lester, 2015; Merikanto, et al., 2015; Müller, Olschinski, Kundermann, & Cabanel, 2016), lower levels of anxiety (Díaz-Morales & Sánchez-Lopez, 2008) lower levels of pessimism (Lewy, 1985), higher levels of satisfaction in life (Randler, 2008b), and better self-esteem (Randler, 2011). The health-related advantages of Larks has been questioned, however, by Putilov (2008).

Another stream of research has suggested that Larks achieve better grade averages at school (Preckel, et al., 2013), perform better in university entrance examinations (Beşoluk, 2011) and go on to earn significantly higher salaries (Bonke, 2012).

A further stream of research points to certain life-style differences between Larks and Owls. For example, Owls consume higher levels of alcohol, nicotine and caffeine from coffee and cola (Adan, 1994). Owls engage in higher levels of casual sex and sexual activity in

uncommitted relationships (Jankowski, Díaz-Morales, Vollmer, Randler, 2014) and display higher levels of intrasexual competition among men (Ponzi et al., 2015). Owls display higher levels of bulimic behaviour (Kasof, 2001) and other eating disorders (Natale, et al., 2008; Walker, Christopher, Wieth, & Buchanan, 2015).

The notion of morningness and eveningness preferences was introduced to the empirical study of work-related psychological health and professional burnout in a study reported by Randler, Luffer, and Müller (2015). In this study they reported on data provided by 177 teachers (48 men, 128 women, and one unspecified) who completed the Maslach Burnout Inventory (Maslach & Jackson, 1986) together with the Composite Scale of Morningness (Smith, Reilly, & Midkiff, 1989). The data demonstrated a significant positive correlation between morningness and personal accomplishment (positive affect) and a significant negative correlation between morningness and emotional exhaustion (negative affect), but no significant association between morningness and depersonalisation.

### **Research question**

Against this background the aim of the present paper is to report on the development of a new measure of preferences for morning activity (the Lark preference) and for evening activity (the Owl preference) designed for use among clergy; and then to explore the impact of these preferences on clergy work-related psychological health, after first taking into account the effects of personal factors (sex) and personality (extraversion and neuroticism).

### **Method**

#### **Procedure**

A questionnaire was posted to all licensed Anglican clergy serving in parochial ministry in the Church in Wales. Participation was entirely voluntary and participants were assured of anonymity and confidentiality. A response rate of 54% produced 338 replies from

clergy who had completed all the relevant measures that form the basis for the present analyses.

### **Participants**

The 338 participants comprised 75% clergymen and 25% clergywomen. In terms of age, 25% were under 50, 47% were in their fifties, 27% in their sixties, and 2% in their seventies.

### **Measures**

*Work-related psychological health* was assessed by the two scales reported by Francis, Kaldor, Robbins, and Castle (2005): the Scale of Emotional Exhaustion in Ministry (SEEM) and the Satisfaction in Ministry Scale (SIMS). Each scale comprised 11 items assessed on a five-point scale: agree strongly (5), agree (4), not certain (3), disagree (2), and disagree strongly (1). Example items from SEEM include: 'I feel drained in fulfilling my functions here', and 'I am less patient with people here than I used to be'. Example items from SIMS include: 'I feel very positive about my ministry here', and 'I am really glad that I entered the ministry'. The 11 items from the SEEM and the 11 items from the SIMS were presented alternately. Scale properties have been reported elsewhere in a study of over 6,000 clergy drawn from a range of denominations in Australia, New Zealand and England (Francis, Kaldor, Robbins, & Castle, 2005), in which both scales showed high internal consistency reliability (Cronbach's alpha for both scales = .84). In the present sample they had alpha reliabilities of .78 (SEEM) and .85 (SIMS).

*Personality* variables were assessed by the abbreviated form of the Eysenck Personality Questionnaire Revised (EPQR-A) reported by Francis, Brown, and Philipchalk (1992) and modified by Francis, Robbins, Loudon, and Haley (2001), using two six-item measures of extraversion and neuroticism. Each item is assessed on a two-point scale: yes (1) and no (2). Example items for the extraversion scale include: 'Are you a talkative person?'



and ‘Can you easily get some life into a rather dull party?’. Example items from the neuroticism scale include: ‘Does your mood often go up and down?’ and ‘Are you a worrier?’. Scale properties reported among 685 students from England, Canada, the USA, and Australia reported Cronbach’s alpha coefficient for extraversion between .74 and .87, and for neuroticism between .84 and .85. In the present sample the extraversion and neuroticism scales had alpha reliabilities of .84 and .78 respectively.

*Diurnal activity patterns* were assessed by an experimental pool of 19 items intended to differentiate between personal preference for morning-related activity (the Lark preference) and personal preference for evening-related activity (the Owl preference). Each item was assessed on a five-point scale: agree strongly (5), agree (4), not certain (3), disagree (2), and disagree strongly (1). Example items for the Lark preference include: ‘I do my best work early in the day’ and ‘I rarely have difficulty getting up in the morning’. Example items for the Owl preference include: ‘I do my best work late in the evening’ and ‘I rarely have difficulty staying awake late into the evening’.

### **Analysis**

Bivariate correlations were used to indicate relationships between all the variables. Hierarchical linear regression was then used to test for the independent effects of Lark scores and Owl scores after controlling for sex and personality variables.

### **Results**

The first step in data analysis was to explore the scaling structure of the 19 items designed to explore diurnal activity patterns. Responses to all 19 items were subject to a factor analysis using alpha factoring for extraction and varimax for rotation. Initial extraction identified two factors which together accounted for 57% of the total variance. Items that loaded poorly or highly on both factors were dropped, leaving two factors of seven items each (table 1). One item ‘I concentrate on difficult tasks in the morning’ loaded slightly more

heavily (negatively) on factor 1 (Owl) but was assigned to the Lark scale for reasons of construct validity.

- insert table 1 and table 2 about here -

On the basis of the factor analysis displayed in table 1, the two scales were generated to produce the Francis Owl-Lark Index (FOLI). Further data regarding the psychometric properties of these two new indices are provided in table 2 in terms of the correlations between the individual items and the sum of the other six items, and the item endorsement as the sum of the agree and agree strongly responses. Both scales demonstrated good levels of internal consistency reliability as reported by the alpha coefficient (Cronbach, 1951): Owl Index,  $\alpha = .90$ ; Lark Index,  $\alpha = .87$ .

- insert table 3 and table 4 about here -

Table 3 summarizes the descriptive statistics for the six continuous variables employed in the analyses. Table 4 then presents the bivariate correlation coefficients among the six continuous scale scores and sex (males = 1, females =2). These correlations indicate that emotional exhaustion was slightly higher among men than among women, positively correlated with neuroticism, negatively correlated with extraversion and with Lark scores, but not correlated with Owl scores. Satisfaction in ministry was not related to sex differences, negatively correlated with neuroticism, positively correlated with extraversion and with Lark scores, but was not correlated with Owl scores. Neither Lark nor Owl scores were correlated with neuroticism, but Owl scores positively correlated with extraversion. These results suggested that Lark scores may more directly predict burnout than Owl scores. Owl scores were higher among extraverts, and extraverts were less inclined to burnout, but there was no direct effect of Owl scores on burnout.

- insert tables 5 and 6 about here -

Tables 5 and 6 present two hierarchical linear regression models exploring the incremental impact of sex and personality (model 1), and sex, personality and diurnal activity (model 2) on emotional exhaustion in ministry and satisfaction in ministry respectively. These analyses confirmed that it was Lark scores rather than Owl scores that predicted both higher scores of satisfaction in ministry and lower scores of emotional exhaustion in ministry. Clergy who displayed the Lark preference for mornings were less likely to suffer from burnout. Clergy who displayed the Owl preference for evenings were neither more nor less likely than others to suffer from burnout.

### **Discussion and conclusion**

This study set out to address two research problems. The first research problem concerned developing a new index of diurnal activity patterns for use among clergy, resulting in the Francis Owl-Lark Indices. The second research problem concerned assessing the effects of the Lark preference for morningness and the Owl preference for eveningness on clergy work-related psychological health. The findings for these two research problems will be addressed in turn.

#### **Francis Owl-Lark Indices**

This study built on experience gained from consideration of earlier measures, including: the 19-item Morningness-Eveningness Questionnaire (MEQ; Horne & Östberg, 1976); the 7-item Diurnal Type Scale (DTS; Torsvall, & Åkerstedt, 1980); the 13-item Composite Scale of Morningness (CSM; Smith, Reilly, & Midkiff, 1989); the 5-item Reduced Morningness-Eveningness Questionnaire (rMEQ; Adan & Almirall, 1990); the ten-item Morningness-Eveningness Scale for Children (MESCC; Carskadon, Vieira, & Acebo, 1993); and the 12-item Early-Late Preferences Scale (Smith, et al., 2002). The view was taken that morningness and eveningness are not opposite ends of a continuum, but independent (although not orthogonal constructs). Factor analysis of the pool of 19 items identified two

distinctive sets of items that clearly corresponded with Lark preferences and with Owl preferences. The two scales correlated highly ( $r = -.62, p < .001$ ), but by no means perfectly. Levels of item endorsement indicated a much stronger preference among clergy for morningness than for eveningness.

### **Personal and personality correlates of diurnal activity patterns**

Considerable previous research has explored the location of diurnal activity patterns within models of personality, with particular attention given to the Major Three Dimensions proposed by Eysenck and Eysenck (1975) and the Big Five Factors proposed by Costa and McCrae (1985). The present study included the Eysenckian measures of extraversion and neuroticism as being of significance in earlier studies. The data demonstrated that Lark preferences were independent of both extraversion and neuroticism. Owl preferences were, however, significantly correlated with extraversion ( $r = .21, p < .001$ ). The finding that the Lark index and the Owl index occupy different locations within the Eysenckian model of personality provide evidence of the differentiation between these two constructs.

Although Randler's (2007) meta analysis of sex differences in the diurnal activity pattern found females to be significantly more morning orientated than males, the present study found no sex differences in either Lark preference or Owl preference among clergy. This finding is consistent with studies that show that the personality characteristics of male and female clergy are by no means as clearly differentiated as the personality characteristics of men and women in the wider population (Francis, 1992; Francis & Musson, 1999; Robbins, Francis, Haley, & Kay, 2001; Francis, Jones, Jackson, & Robbins, 2001; Robbins, Littler, & Francis, 2011; Brewster, Francis & Robbins, 2011).

### **Assessing clergy work-related psychological health**

Two models of professional burnout and work-related psychological health are well established within the field of clergy studies (for review see Francis, 2018): the model

proposed by Maslach and Jackson (1986) as operationalised by the Maslach Burnout Inventory, and the model proposed by Francis, Kaldor, Robbins, and Castle (2005) as operationalised by the Francis Burnout Inventory. This study employed the Francis Burnout Inventory that draws on the classic balanced affect model proposed by Bradburn (1969). This model suggests that effects of negative affect can be offset, to some extent, by the effects of positive affect. In the Francis Burnout Inventory negative affect is assessed by the Scale of Emotional Exhaustion in Ministry, while positive affect is assessed by the Satisfaction in Ministry Scale.

Studies assessing professional burnout and work-related psychological health among clergy, using either the Maslach model or the Francis model, have indicated that burnout and poor work-related psychological health are significantly correlated with low extraversion scores and high neuroticism scores (for review see Francis, 2018). The present study is consistent with these general findings. High satisfaction in ministry was associated with low neuroticism scores ( $r = -.45, p < .001$ ) and high extraversion scores ( $r = .29, p < .001$ ). High emotional exhaustion in ministry was associated with high neuroticism ( $r = .63, p < .001$ ) and low extraversion ( $r = -.21, p < .001$ ).

The wider literature does not demonstrate a consistent pattern of sex differences in burnout and work-related psychological health among clergy (for review see Francis, 2018). The present study indicates that clergymen experience higher levels of emotional exhaustion than clergywomen ( $r = -.15, p < .01$ ), and that there are no differences between clergymen and clergywomen in levels of satisfaction in ministry.

### **Work-related psychological health and diurnal activity patterns**

A common-sense hypothesis might proceed as follows. While the varied work of parish ministry may occupy all parts of the day, in many parishes there may be a particular emphasis to hold meetings in the evening and to concentrate some aspects of pastoral visiting

and pastoral engagement within the evening. It is likely that Owls will find such engagement more congenial than Larks. At the same time, the present study indicates that Larks, rather than Owls are recruited into parish ministry. We may expect then, Larks to be at greater risk from professional burnout and poor work-related psychological health, while Owls may have greater propensity to thrive in parish ministry. This common-sense hypothesis is supported by the two empirical findings from the present data that Owls recorded higher extraversion scores and that higher extraversion scores are associated with greater levels of satisfaction in ministry and lower levels of emotional exhaustion in ministry.

However, what militates against this common-sense hypothesis are the findings rehearsed in the introduction to this paper that the health-related correlates (both physical and psychological) of the diurnal rhythm have generally pointed to a better trajectory among Larks. For example, Larks show better general health (Paine, Gander, & Travier, 2006), lower incidence of depression (Mecacci & Rocchetti, 1998; Chelminski, Ferraro, Petros, & Plaud, 1999; Lester, 2015; Merikanto, et al., 2015; Müller, Olschinski, Kundermann, & Cabanel, 2016), lower levels of anxiety (Díaz-Morales & Sánchez-Lopez, 2008) lower levels of pessimism (Lewy, 1985), higher levels of satisfaction in life (Randler, 2008b), and better self-esteem (Randler, 2011).

In order to take into account the complexity among the bivariate associations between diurnal activity preferences, personality and wellbeing, the present study controlled for sex differences and for differences in neuroticism and extraversion before testing for the effects of diurnal activity preferences on emotional exhaustion in ministry and on satisfaction in ministry. The data found no support for the common-sense hypothesis. On the contrary, the data demonstrated that, among Anglican clergy in Wales, Lark preferences were associated with higher satisfaction in ministry and with lower emotional exhaustion in ministry, while

Owl preferences were correlated neither with satisfaction in ministry nor with emotional exhaustion in ministry.

**Further research**

The present study is limited by concentration on just one group of clergy, Anglican clergy in Wales. The intriguing findings may, nonetheless add new insights into individual differences in levels of clergy professional burnout and work-related psychological health. Replication of this study among other groups of clergy would be helpful in testing the extent to which the findings may be generalised.

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Table 1

*Factor analysis of items in the Francis Owl-Lark Indices*

	Owl	Lark
I am definitely an evening type of person	<b>.81</b>	-.38
I am at my best late at night	<b>.81</b>	-.27
I do my best work late in the evening	<b>.80</b>	-.28
I concentrate on difficult tasks best in the evening	<b>.75</b>	-.32
I like to stay up late at night	<b>.72</b>	-.18
I rarely have difficulty staying awake late into the evening	<b>.60</b>	-.09
I would find it very difficult to stay awake after midnight every day	<b>-.60</b>	.00
I concentrate on difficult tasks best in the morning	-.55	<b>.50</b>
I would find it very difficult to get up at 6.00 am every day to go to work	.14	<b>-.69</b>
I am definitely a morning type of person	-.56	<b>.66</b>
I am at my best in the morning	-.54	<b>.64</b>
I rarely have difficulty getting up in the morning	-.08	<b>.61</b>
I do not mind getting up early in the morning to start a journey	-.07	<b>.60</b>
I do my best work early in the day	-.53	<b>.57</b>

Note. Alpha extraction and varimax rotation. Loadings in bold were assigned to the relevant factor.

Table 2

*Scale properties of the Francis Owl-Lark Indices*

	<i>r</i>	Yes %
<i>Lark Index</i>		
I am at my best in the morning	.79	70
I do my best work early in the day	.73	67
I rarely have difficulty getting up in the morning	.51	64
I do not mind getting up early in the morning to start a journey	.50	88
I concentrate on difficult tasks best in the morning	.67	72
I am definitely a morning type of person	.80	59
I would find it very difficult to get up at 6.00 am every day to go to work*	.57	38
<i>Owl Index</i>		
I am at my best late at night	.82	21
I do my best work late in the evening	.81	21
I rarely have difficulty staying awake late into the evening	.57	42
I like to stay up late at night	.71	33
I concentrate on difficult tasks best in the evening	.76	17
I am definitely an evening type of person	.84	21
I would find it very difficult to stay awake after midnight every day*	.54	70

Note: *r*, correlation between the individual item and the sum of the other six items

yes %, percentage endorsement as sum of agree and agree strongly responses

\*, these items were reverse coded to compute the two indices

Table 3

*Descriptive statistics for the continuous variables used in the analyses*

	alpha	N Items	Mean	SD	Range	
					Lo	Hi
Scale of Emotional Exhaustion in Ministry	.78	11	27.8	7.2	11	52
Scale of Satisfaction in Ministry	.85	11	42.1	5.2	21	54
Lark Index	.87	7	25.5	5.4	10	35
Owl Index	.90	7	17.7	6.2	7	35
Extraversion Scale	.84	6	3.1	2.2	0	6
Neuroticism Scale	.78	6	2.1	1.9	0	6

Table 4

*Correlation matrix*

	N	E	O	L	Fem	SIMS
SEEM	.63 <sup>***</sup>	-.21 <sup>***</sup>	.01	-.18 <sup>**</sup>	-.15 <sup>**</sup>	-.63 <sup>***</sup>
SIMS	-.45 <sup>***</sup>	.29 <sup>***</sup>	-.01	.19 <sup>***</sup>	.04	
Female (Fem)	-.08	.06	-.05	-.03		
Lark score (L)	-.09	.01	-.62 <sup>***</sup>			
Owl score (O)	-.09	.21 <sup>***</sup>				
Extraversion (E)	-.25 <sup>***</sup>					
Neuroticism (N)						

Table 5

*Hierarchical linear regression of SEEM*

Model		B	SE	$\beta$	t
1	Female	-1.55	0.71	-.09	-2.21*
	Extraversion	-0.19	0.14	-.06	-1.36
	Neuroticism	2.30	0.17	.61	13.90***
2	Female	-1.67	0.70	-.10	-2.38*
	Extraversion	-0.18	0.14	-.06	-1.24
	Neuroticism	2.25	0.17	.59	13.58***
	Lark score	-0.19	0.07	-.15	-2.65**
	Owl score	-0.03	0.07	-.02	-0.43

Table 6

*Hierarchical linear regression of SIMS*

Model		B	SE	$\beta$	t
1	Female	-0.04	0.57	.00	-0.08
	Extraversion	0.45	0.11	.19	3.93***
	Neuroticism	-1.11	0.13	-.41	-8.25***
2	Female	0.05	0.57	.00	0.09
	Extraversion	0.44	0.12	.19	3.78***
	Neuroticism	-1.06	0.13	-.39	-7.93***
	Lark score	0.16	0.06	.17	2.72**
	Owl score	0.02	0.05	.02	0.38