Qualitative and quantitative analyses of a 'lock and key' hypothesis of depression

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ABSTRACT

Background. We examine a 'lock and key' ('L–K') hypothesis to depression which posits that early adverse experiences establish locks that are activated by keys mirroring the earlier adverse experience to induce depression.

Methods. Two-hundred and seventy clinically depressed patients were examined with open-ended and pre-coded interview questions to ascertain both early adverse experiences and precipitating life events. Qualitative and quantitative data analyses examined for any associations between developmental 'locks' and precipitating 'keys'.

Results. Qualitative assessment suggested 'L–K' links in almost one-third of the sample, and examples are provided. While quantitative analyses indicated significant associations between several identical 'lock' and 'key' constructs, evidence of specificity was rare. When individual 'locks' and 'keys' were consolidated into three higher-order constructs, variable models were suggested, including a non-specific link, a specific link and absence of any link. 'L–K' links appeared more likely in those with 'non-melancholic' (*versus* 'melancholic') depression, with the seemingly greater relevance to 'reactive' (*versus* 'neurotic') depression in the quantitative analyses inviting speculation that that 'disorder' may be more a reaction to a salient rather than a severe stressor.

Conclusions. This exploratory study suggests that early adverse experiences may variably establish specific and non-specific patterns of vulnerability to having depression triggered by exposure to salient mirroring life event stressors.

INTRODUCTION

Clinical psychiatric formulations commonly assert a causal link between early developmental factors and subsequent psychopathology in adulthood. Developmental factors are assumed to create a vulnerability that disposes to decompensation by either lowering the threshold to a wide range of triggering factors or, more selectively, to triggers that have specific salience.

We suggest the term 'lock and key' ('L–K') to capture the latter situation, and examine that hypothesis to adult depression. Specifically, the hypothesis postulates that adverse circumstances or events that occur in childhood and adolescence (e.g. parental rejection) effect a 'vulnerability' (i.e. 'lock') to depression, which is triggered when the individual is exposed to life events or 'keys' (e.g. interpersonal rejection) that mirror the earlier adverse developmental experiences – even though their salience as vulnerability factors may have been latent for an extended period. Thus, the hypothesis emphasizes issues of continuity and specificity.

Variants of the hypothesis have been put by numerous theorists, albeit not limited to an outcome of depression. Thus, Abraham (1911) put a psychoanalytical view that 'disappointments in love' in childhood could be reactivated by similar disappointments in adulthood, leading to depression. Bowlby (1969, 1973) argued for

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'continuity' of attachments, with deficiencies in childhood experiences with the primary caregiver determining disturbances in adult attachments and subsequent psychopathology. The early adverse events are presumed to dictate cognitive sets, which can be broad – as illustrated by Seligman's (1975) proposal that the habitual experience of unpredictable and uncontrollable events can lead to 'learned helplessness' (with cognitive, motivational and emotional deficits) and Beck *et al.*'s (1979) concept of the 'cognitive triad' (with interactions with important care-givers building representations of the self, others and the future). Brown *et al.* (1977) suggested that quite narrow and specific early adverse events (such as death of a mother) exert an 'enduring cognitive…attitude' that one's own efforts are useless. Furthermore, Brown & Harris (1978) argued that the 'depressive-prone person has become sensitized in childhood and ado-lescence to certain types of life situations. These are responsible for establishing the original negative attitudes and are the prototypes of specific stresses, which may later activate these constellations and lead to depression' (p. 267). The broad proposition that specificity exists across a range of early adverse childhood experiences and mirroring stressors in adulthood has, however, been essentially limited to theor-etical consideration. We report an exploratory study of the hypothesis with qualitative and quantitative analyses.

The extent to which the postulate, if valid, can be demonstrated qualitatively is likely to be influenced by a range of factors, including the capacity of depressed patients to remember and report such events validly, the thoroughness and capacity of the interviewer to elicit relevant patient disclosures, the 'type' of depression, and any researcher bias.

We also undertake quantitative analyses, to quantify associations and redress biases that may have influenced the qualitative analyses. In intercorrelating component 'locks' and 'keys', there is however an immediate interpretive problem as constructs may be defined and interpreted broadly or narrowly. As examples, 'rejection' can encompass a wide range of experiences, or be operationalized as exposure to quite specifically defined acts; a 'dysfunc-tional' parent is unlikely to express dysfunction across one parameter only; while life event

stressors are rarely limited to a single domain or construct. Such realities suggested that we should commence with a wide range of relatively narrow adverse developmental factors and trig-gering life event stressors, but then aggregate such variables into higher-order constructs.

METHOD

Patient sample

Our sample involved 270 patients with a major depressive episode meeting DSM-IV criteria (APA, 1994) for a major depressive episode present for 24 months or less, as detailed in another report (Parker *et al.* 1997). Most were attending a tertiary referral Mood Disorders Unit (and were therefore more likely to have had prolonged or treatment-resistant depressive epi-sodes) but a significant minority were routine referrals to our consultants, so ensuring a more heterogeneous mix of clinical depressive con-ditions. Social class was assessed by the four-class Congalton (1969) scale.

Qualitative assessment procedures

During a detailed clinical research interview conducted by one of our consultant psychiatrists, information was sought concerning precipitating life events and developmental vulnerabilities by open-ended questions. The strategy involved asking the patient to focus on the attributed life event stressors preceding their current episode of depression and to identify the most salient (i.e. 'most let or got you down') one, here a potential 'key'. Details of the exact stressors as reported by the patient (i.e. not interpreted by the psychiatrist) were recorded by the interviewer (e.g. 'marital dispute and spouse leaving the home'). The patient was then asked to describe 'how the stressor got them down', in order to ascertain the immediate consequences of the depressogenic stressor for the patient (e.g. 'patient felt rejected and alone') – again with the patient's (and not the psychiatrist's) de-scription recorded. The patient was then ques-tioned to determine any cognitive schema acti-vated by the stressor (e.g. 'patient always knew he/she would be rejected'). Based on all the clinical interview information, the psychiatrist was required to elicit and detail the most distinct adverse developmental event (here the potential 'lock') as effected by parents or other parent

figures (e.g. 'patient was deserted by mother when nine years old, and given over to relatives by an emotionally distant father'). Thus, the qualitative analyses focused on identification of the most salient 'locks' and 'keys', as identified at differing stages of the interview by the patient and independent (as much as possible) of any interpretation by the psychiatrist. All interviewing psychiatrists were required to state whether they had found evidence of a 'L–K' link (options being 'no', 'possibly', 'distinctly', and 'not known/not clear').

Quantitative assessment procedures

Our quantitative data set required the patient to rate their degree of exposure to 15 specific experiences (listed in Table 3) in their first 16 years on pre-coded scales. The rating options for potential 'locks' were 'not at all', 'slight', 'moderate' and 'severe' (coded 0–3), with all constructs required to be rated. Secondly, and somewhat later in the interview, patients were asked to quantify the extent to which the precipitating life event stressor that had most 'affected' them had evoked a response on 14 differing parameters (also listed in Table 3). Rating options for these potential 'keys' were 'not at all', 'slight', 'moderate' and 'severe' and coded 0–3, with all constructs required to be rated. The last construct 'learned helplessness' often required explanation to the patient (e.g. a parental environment or stressful situation that 'put you in a position where you felt that you were unable to exert any influence yourself, and instead that others had total control over the outcome'), with putting an explanation for this single item risking a biasing effect. Thus, these analyses sought to assess the influence of multiple potential locks and keys (rather than the most salient as sought in the qualitative analyses).

RESULTS

One hundred and five (39%) met DSM-IV criteria for melancholia. The research psychiatrist assigned an MDU (Mood Disorders Unit) depressive clinical diagnosis (see Parker *et al.* 1994) to each subject. Twenty-five (9% of our sample) met MDU clinical criteria for 'psychotic' depression (PD), while 83 (31%) generated 'endogenous' depression (ED) diagnoses,

Table 1. *Comparison of subjects assessed as evidencing a 'lock and key' link by both the interviewing psychiatrist and independent psychologists* (versus *remaining subjects*), *examined against socio-demographic and diagnostic variables*

| | 'Lock and key' | | |
	Yes ($N = 78$)	No ($N = 192$)	Significance test
Variable			
Age†	39·6	44·8	$F = 3·55$
Disorder duration in years‡	13·7	11·5	$F = 4·93*$
Sex			
Female	68%	62%	$\chi^2 = 0·85$
Male	32%	38%	
Years of education	12·7	12·2	$t = 1·04$
Social class			
Group 1 (e.g. highest)	5%	4%	$\chi^2 = 5·70$
Group 2	11%	22%	
Group 3	55%	42%	
Group 4 (e.g. lowest)	28%	31%	
Clinical diagnosis of depression			
'Psychotic' (PD)	3 (14%)	19 (86%)	$\chi^2 = 11·23*$
'Endogenous' (ED)	17 (20%)	67 (80%)	
'Neurotic' (ND)	37 (38%)	59 (62%)	
'Reactive' (RD)	21 (31%)	47 (69%)	
DSM-IV			
Melancholia	32%	42%	$\chi^2 = 2·16$
Non-melancholia	68%	58%	

*, $P < 0·05$; **, $P < 0·01$.
† Analysis includes 'clinical diagnosis' as covariate.
‡ Analysis includes 'current age' as covariate.

94 (35%) received a diagnosis of 'neurotic' depression (ND), and 68 (25%) a diagnosis of 'reactive' depression (RD).

Qualitative assessment

Within the total sample of 270 subjects, both the documented developmental vulnerabilities (e.g. potential 'locks') and/or documented stressors (e.g. potential 'keys') were grouped by the assessing psychologists. Thirteen categories of 'locks' were identified, with the most common being: (*i*) 'lack of emotional support' (experienced by 13·4% of the sample); followed by (*ii*) a 'lack of secure emotional base' (12·6%); (*iii*) 'lack of personal control' (11·8%); (*iv*) 'rejection' or a 'threat of rejection' (11·0%); (*v*) 'abuse' (9·4%); and (*vi*) 'criticism' (8·7%). Similarly, the documented depressogenic stressors or 'keys' were categorized into 17 groups,

Table 2. *Examples of patients' 'lock and key' links to depression*

Patient	'Lock' (Developmental vulnerability)	'Key' (Triggering stressor)	Patient's cognitive schema	Patient's interpretation of stressor
A	Death of both parents when 11, loss of family atmosphere, as children were split up and fostered out	'Loss of job and loss of identity'	'I'm always left abandoned – by Army, by parents, by fiancé	'Deep sense of loss of secure base and self-esteem; felt let down by employer'
B	'Forced' into boarding school at young age, with 'no choice' allowed	'Triple bypass. Told I would feel better soon after. Doctors hinted it may not have been necessary'	'I am powerless'	'Felt opening my chest was like a physical assault'
C	Mother's departure after putting patient in orphanage – terrified of being dependent	'Husband separated after a discussion – he left'	'If people really get to know me they won't like me and they'll leave'. Always expects to be rejected	'This is what I predicted would happen and here it is'
D	Two siblings died as children, leaving parents worried about illness. Father always kept things to himself – always worried about illness	'Son got married, and I had Crohn's disease at the time'	'I don't want to lose you, worried that you'll die'	'Worrying about son's illness, worrying he will die'
E	Physical and sexual abuse by father.	'Physical illness'	'Nothing I can do for myself. No protection from outside world'	'I felt hopeless, with no self-esteem, I am more at whim of family members'
F	Afraid of violent, abusive and domineering father, as eldest son, he felt inadequate to stand up to him.	'End of four-year relationship with girlfriend'	'I should be more of a man' 'I should be more successful' 'I should be more caring'	'Felt threatened by intimacy. Should have tried harder. Can't do anything to improve the situation'

the most common being: (*i*) 'lack of emotional support' (experienced by 12·6% of the sample); (*ii*) 'loss' (11·8%); (*iii*) 'instability under stress' (9·4%); (*iv*) 'learned helplessness' (8·7%); and (*v*) 'rejection or threat of rejection' (7·1%).

Analyses examining for differences between individual psychiatrists in rating 'L–K' links involved four of the nine consultants who had undertaken 93% of the assessments. Results indicated that rating the salience of 'L–K' links varied significantly ($\chi^2 = 15.67$, $P < 0.01$) with 'positive' rates ranging from 10·2% to 43·3% across the consultants.

For the 161 subjects rated by the interviewing psychiatrists as either possibly ($N = 70$) or distinctly ($N = 91$) evidencing a 'L–K' link, the two psychologist raters (independently of each other) assessed the documented material to determine whether there was evidence of a clearly recorded developmental vulnerability (lock) and a mirroring triggering life-event (key). If their views were discordant, nuances were discussed and a consensus judgement (i.e. 'L–K' present *v.* absent) made. Such links were rated as

present by both psychologists for 78 (or 29% of the total sample), with this subsample then comprising those with the clearest qualitative evidence of a 'L–K' link.

Table 1 data compare those 78 judged by both the interviewing psychiatrist and the independent psychologists as evidencing a 'L–K' link with the residual 192 subjects in the whole sample. Certain patient variables (i.e. sex, years of education, social class category, and DSM-IV melancholia *v.* non-melancholia status) did not distinguish the subgroups. Those rated positive for a 'L–K' link were significantly younger (a difference not sustained when we controlled for clinical diagnosis), had been depressed longer, were more likely to have been assigned a clinical diagnosis of ND or RD (74% *v.* 54%), and less likely to receive PD or ED diagnoses (26% *v.* 45%). Such trends (e.g. for the likely 'melancholic' depressive disorders to be under-represented) were not formally significant, however, in relation to the DSM system.

Table 2 provides some examples of 'L–K' links, and again we note that the data represent

Table 3. *Polychoric correlations of individual 'keys' and 'locks' in whole sample* (N = 216)

Keys	Locks														
	Rejection	Criticism	Unpredict-ability	Violence/physical abuse	Emotional/verbal abuse	Lack of protection	Over-control	Lack of support in times of distress	Loss, by death	Loss, by divorce/separation	Leaving child alone	Lack of secure emotional attachment base	Making child feel in danger	Making child feel unsafe	Learned helplessness
Rejected	0·22***	0·29***	0·22***	0·08	0·15*	0·19**	0·17*	0·27***	−0·08	0·11	0·37**	0·31***	0·19**	0·20**	0·29***
Criticized	0·16*	0·34***	0·23***	0·14*	0·23***	0·15*	0·27***	0·26***	−0·02	−0·15*	0·27***	0·27***	0·22***	0·33***	0·29***
Exposed to unpredictable stress	0·11	0·06	0·22***	0·17*	0·14	0·20**	0·07	0·10	−0·16*	0·28***	0·24***	0·17*	0·21**	0·27***	0·25***
Violently/physically abused	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emotionally/verbally abused	0·34***	0·43***	0·36***	0·35***	0·40***	0·35***	0·46***	0·35***	0·08	0·26***	0·46***	0·44***	0·41***	0·46***	0·32***
No longer protected against threat	0·37***	0·31***	0·22***	0·09	0·23***	0·24***	0·14*	0·28***	−0·01	0·20**	0·39***	0·38***	0·22***	0·29***	0·28***
Overcontrolled	0·00	0·12	0·08	−0·10	0·13	−0·03	0·42***	0·04	−0·26***	0·16*	0·09	0·07	0·06	0·16*	0·21**
Not emotionally supported	0·37***	0·41***	0·34***	0·11	0·25***	0·29***	0·24***	0·43***	−0·04	0·22***	0·46***	0·47***	0·17*	0·32***	0·44***
Deserted	0·20**	0·25***	0·14	0·02	0·11	0·20**	0·13	0·25***	−0·06	0·21**	0·36***	0·41***	0·26***	0·24***	0·24***
Abandoned	0·36***	0·42***	0·20**	0·07	0·23***	0·21**	0·16*	0·34***	−0·18**	0·24***	0·48***	0·52***	0·19**	0·28***	0·32***
Without a secure base	0·21**	0·17*	0·10	0·00	0·14*	0·10	0·09	0·18**	−0·02	0·29***	0·30***	0·25***	0·10	0·16*	0·27***
In danger from key others	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unsafe from key others	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Learned helplessness	0·25***	0·33***	0·26***	0·33***	0·35***	0·29***	0·18**	0·33***	−0·17*	0·17*	0·36***	0·42***	0·19**	0·22***	0·66***

$*P < 0.05$; $**P < 0.01$; $***P < 0.001$.
— Insufficient frequencies for analyses.

the actual patients' responses as recorded by the interviewing psychiatrist. We also record the patient's own interpretation of the 'meaning' of the life event stressor and any cognitive schema elicited by the triggering stressor.

The first patient ('A') lost both her parents when she was a child, and was subsequently separated from her siblings. She carried a cognitive schema that it was her destiny to be abandoned (based not only on the death of her parents, but by a subsequent Army employer and by her fiancé). Her recent depression was precipitated by loss of employment (which had previously provided a 'secure base') and feeling let down by her employer. Thus, her depression trigger was loss of a secure base, activating her latent cognitive schema that she was 'destined to be abandoned' on the basis of early parental loss. By contrast, for patient B, 'loss of personal control' underpinned the link. Here the patient had internalized her recent surgery as 'a physical assault' – an experience that had provoked her cognitive schema of personal powerlessness. For her, the psychological experiences associated with her recent operation had a similar meaning to those experienced during childhood (e.g. forced into boarding school without a choice). The stressor for this patient had significance beyond major surgery *per se* and was likened to an assault or invasion (which compromised personal control and power), an interpretation based on her earlier sense of powerlessness, and maintained by her cognitive schema of being powerless. Links may appear more tenuous in the other vignettes (say patient F). Here, however, we would argue that the cognitive schema was essentially one of not being 'more of a man' (i.e. the lock = not standing up to the father; the key = not accepting the adult responsibility of making an intimate relationship work).

Quantitative assessment

Our initial strategy was to intercorrelate (using polychoric (r_p) correlations) scores on all 15 quantified developmental stressors ('locks') with scores on all 14 depression precipitants ('keys'). In Table 3 we report (shaded) coefficients where links would be anticipated because of identical or similar constructs, although three 'keys' ('violently or physically abused'; 'in danger from key others'; and 'unsafe from key others') were

excluded from analyses as they were reported by less than 15 % of the sample.

Thus, if (for example) exposure to parental rejection leads to 'rejection' having specific depressogenic salience, we would anticipate a significant coefficient when 'rejection' as a lock is intercorrelated with 'rejection' as a key. Our analytic strategy involves a component of Campbell & Fiske's (1959) multi-trait–multi-method technique for assessing discriminant validity, namely, that a coefficient in the validity diagonal should be higher than the other coefficients lying in the same row and column. In the instance of 'rejection', the relevant coefficient of 0·22 is exceeded by five coefficients in the corresponding row and five in the corresponding column, so indicating lack of specificity. Only one 'L–K' link (i.e. 'learned helplessness') meets our analytical criterion, although several approximate – parental 'criticism' being linked with 'criticism' as a depressogenic stressor ($r_p = 0·34$); parental 'overcontrol' of the child linking with the depressogenic stressor of 'overcontrol' ($r_p = 0·42$); and parental 'leaving child alone' linked with depressogenic 'abandonment' ($r_p = 0·48$) as well as depressogenic 'desertion' ($r_p = 0·36$).

Table 3 coefficients suggest that some putatively narrow 'locks' (e.g. rejection) were associated with a broad number of depressogenic 'keys' (here, lack of protection, emotionally unsupported and being abandoned). The large number of associations involving 'learned helplessness' (whether examined as a lock or as a key) suggested that this was a more complex or too global a construct. Such findings underlined the point made in the introduction – that we should examine for 'L–K' links across appropriately consolidated constructs. We, therefore, undertook a principal components analysis (PCA) of the 15 locks, examined the rotated pattern matrix, and with a three-factor solution appearing the most meaningful, accounting for 46·1 %, 9·5 % and 7·1 % of the total variance. Table 4 lists the three factors, their factor loadings and their indicative labels (i.e. 'abuse'; 'insecurity'; and 'loss').

Similarly, we undertook a PCA of the 14 keys, with a rotated three-factor solution appearing somewhat superior to the four-factor solution. The first factor, labelled 'rejection' accounted for 33·2 % of the variance, the second 'unsafe/

Table 4. *Principal component analysis (imposed three-factor solutions) for separate 'lock' and 'key' constructs, together with percentage reporting any event (to any degree)*

Factor 1 'Abuse'			Factor 2 'Insecurity'			Factor 3 'Loss'		
Item	Loading	Prevalence (%)	Item	Loading	Prevalence (%)	Item	Loading	Prevalence (%)
Locks								
Violence or physical abuse	0·91	27	Overprotection/ overcontrol	0·69	49	Loss, by death	0·76	16
Making child feel in danger	0·87	24	Lack of secure emotional attachment base	0·66	45	Loss, by divorce/ separation	0·43	14
Emotional or verbal abuse	0·80	43	Leaving child alone and being quite uninterested	0·62	36			
Making child feel unsafe	0·80	28	Lack of support in times of distress	0·57	50			
Lack of protection against threatening others	0·74	34	Criticism	0·56	55			
Unpredictability	0·71	45	Creating a situation of 'learned helplessness'	0·50	36			
Rejection	0·45	44						

Factor 1 'Rejection'			Factor 2 'Unsafe/danger'			Factor 3 'Control/abuse'		
Item	Loading	Prevalence (%)	Item	Loading	Prevalence (%)	Item	Loading	Prevalence (%)
Keys								
Deserted	0·86	31	Unsafe from key others	0·87	13	Overcontrolled/ overprotected	0·73	24
Abandoned	0·85	27	In danger from key others	0·80	10	Emotionally/ verbally abused	0·69	19
Rejected	0·68	39	No longer protected against threat posed by others	0·60	24	Violently or physically abused	0·67	5
Not emotionally supported	0·66	54				'Learned helplessness'	0·50	52
Without a secure base	0·62	50				Exposed to unpredictable stress	0·41	64

danger' for 12·4%, and the third 'control/abuse' for 10·2% of the variance. As the factors in one set are not mirror images of the other set, our capacity to demonstrate specificity (if specificity exists) is limited. Scale scores were created by summing raw scores on the items identified in each factor.

We then intercorrelated lock and key scale scores in a sample of 216 subjects for whom we had complete data sets. Examining that sample first, Table 5 data demonstrate that scores assessing developmental exposure to parental insecurity (i.e. Factor 2) were consistently linked ($Ps < 0·01$) with the three consolidated 'key' scores, albeit somewhat more strongly for the 'rejection' ($r = 0·39$) and 'control/abuse' fac-

Table 5. *Pearson correlations of consolidated 'L–K' scale scores in whole sample and in subsamples of those rated by psychiatrists as having links present or absent*

Keys – depressogenic stressors		Locks – parental environment		
		'Abuse'	'Insecurity'	'Loss'
'Rejection'	– All subjects	0·24**	0·39**	0·04
	– LK-P	0·13	0·36**	0·03
	– LK-A	0·24	0·17	0·08
'Unsafe/danger'	– All subjects	0·20**	0·27**	0·13*
	– LK-P	0·26**	0·38**	0·19*
	– LK-A	−0·04	−0·08	−0·02
'Control/abuse'	– All subjects	0·28**	0·38**	0·03
	– LK-P	0·31**	0·38**	0·04
	– LK-A	−0·10	0·15	−0·02

* $P < 0.05$; ** $P < 0.01$.
LK-P, 'L–K' present – rated possibly or distinctly.
LK-A, 'L–K' absent.

Table 6. *Correlation of consolidated 'lock' and 'key' scale scores, in three clinically diagnosed depressive subtypes*

Keys – depressogenic stressors		Locks – parental environment		
		'Abuse'	'Insecurity'	'Loss'
'Rejection'	ED	0·12	0·42***	0·19
	ND	0·01	0·21	0·15
	RD	0·32**	0·40***	−0·05
'Unsafe/danger'	ED	0·22	0·22	0·22
	ND	0·11	0·02	0·15
	RD	0·28*	0·39**	0·18
'Control/abuse'	ED	0·22	0·28*	−0·18
	ND	0·07	0·22	−0·06
	RD	0·47***	0·51***	0·23

ED, endogenous depression; ND, neurotic depression; RD, reactive depression.
*, $P < 0.05$; **, $P < 0.01$; ***, $P < 0.001$.

tors ($r = 0.38$) than for the 'unsafe/danger' ($r = 0.27$) factor. Exposure to developmental 'abuse' had weaker associations ($Ps < 0.01$) with each of the three 'key' factors but did have the strongest association ($r = 0.28$) with 'control/abuse', while exposure to parental loss was minimally associated with each of the three key factors (rs of 0·03 to 0·13).

In Table 5 we also report intercorrelations of scale scores for two subsamples: those rated by the interviewing psychiatrist as not evidencing any 'L–K' link, and those judged as having possible or distinct links. If: (*i*) our psychiatrists validly made such judgements; (*ii*) 'L–K' links do exist; and (*iii*) our factors share some construct similarity, we would expect stronger associations where 'L–K' links were judged as present by the clinicians. Importantly, for those judged qualitatively as not evidencing any 'L–K' links, associations for the quantitative data were non-existent, consistent with those clinical judgements. For those clinically judged to have a 'L–K' link, an early parental environment of 'insecurity' was linked similarly (i.e. $rs = 0.36$–0·38) with all three depressogenic keys, suggesting that an early environment of an insecure base may act more as a general rather than specific vulnerability factor to a range of precipitating stressors. By contrast, we find (in this same subset) limited evidence of specificity, in that exposure to an 'abusive' parental environment was more strongly linked with

depressogenic stressors having an 'unsafe/danger' connotation ($r = 0.36$) and 'control/abuse' ($r = 0.31$) connotations, than with 're-jection' ($r = 0.14$). Even greater specificity was demonstrated for parental 'loss', in that that lock was significantly linked only with depressogenic stressors having 'unsafe/danger' connotations (i.e. $r = 0.19$ v. rs of 0·03 and 0·04).

We then examined whether 'L–K' links had specificity to depression subtyping. Intercorrelations of scale scores for those diagnosed by DSM-IV criteria as having melancholia ($N = 89$) generated coefficients of a similar order to those with DSM non-melancholia ($N = 127$). Similar analyses were undertaken in those receiving three alternative clinical depressive subtyping diagnoses – endogenous (ED), neurotic (ND) and reactive (RD) depression. Table 6 data shows that no significant links were demonstrated for those with an ND diagnosis. For those with an ED diagnosis, parental 'insecurity' was weakly to moderately linked with all three consolidated depressogenic constructs. Significant and stronger associations were most clearly demonstrated for those receiving an RD diagnosis. Here two locks (parental 'abuse', and 'insecurity'), but not parental loss, were linked with all consolidated keys.

DISCUSSION

We report an exploratory study. Clearly, several methodological components were limited (e.g. self-report ratings assessing the salience of

structured antecedent stressors as possible 'keys'), so that future studies may need to adopt distinctly differing methodologies.

Data from our qualitative analyses (and presented in Table 2) illustrate key components of our 'L–K' hypothesis, with examples of exposure to certain adverse experiences in childhood which may have established a vulnerability presumably 'locked' in by an ongoing cognitive schema. Subsequent exposure to a life event – with a similar meaning or theme to the developmental vulnerability stressor – appeared to be interpreted in line with the meaning ascribed to the developmental stressors and maintained by the on-going cognitive schema. Clearly, we imply a sequence (e.g. developmental vulnerability effecting a diathesis to certain triggering stressors in adulthood), but there are other possibilities. For instance, an individual may (for whatever reason) have a particular way of interpreting stressors in adulthood and then apply that cognitive bias retrospectively in remembering and interpreting events in their earlier life. While cognitive schema may drive any links (by 'locking in' components of the early adverse environment at the cognitive level), we did now wish to focus on that construct – because such schemas (however derived) could then totally shape interpretation of developmental and life event stressors. Thus, our model prioritized identification of nominated experiences rather than any cognitive mediating 'locking in' mechanism, because of the limited capacity to actually establish that the latter might have emerged from earlier adverse events rather than reflect a mood state cognitive bias. We suggest that many of our illustrated cases involved relatively factual events (e.g. death of a parent, sexual abuse) rather than being open to subjective interpretation (e.g. interpreting parents as 'rejecting' or other experiential constructs amenable to response biases), and that by relying on patients' reports we pre-empted the interviewing psychiatrist ascribing a 'meaning' to the patient's depressogenic stressor and then selectively abstracting a similar construct from the patient's developmental history.

Prevalence of 'lock and key' depressions

While one-half of the sample were rated by the interviewing psychiatrists as possibly or clearly evidencing a 'L–K' link, only 29% were additionally rated by both psychologist raters as having such a link clearly evident in the documentation derived at interview. Such prevalence estimates must be influenced by a range of factors, including sample nuances, interview sophistication and documentation, and are therefore of no general relevance. We did demonstrate considerable variability across the consultant psychiatrists in prevalence estimates of 'L–K' links. This could reflect their variable interest (or sophistication) in assessing 'keys', 'locks' and related factors, or the reality that our psychiatrists have differing clinical and research priorities which dictate quite differing referral profiles. No formal reliability (e.g. test–retest, inter-rater) analyses were undertaken, a methodological limitation that should be redressed in future studies. The higher prevalence of 'L–K' links in younger subjects could reflect a 'passage of time' effect, whereby nuances of the early environment are lost to memory or lose their 'vulnerability salience' with repeated episodes over time.

Nature of 'locks', 'keys' and their links

Qualitative analyses suggested a small set of dominant 'lock' and 'key' themes within our sample. 'Lack of emotional support' was the most common precipitant to adult depression and the most common identified vulnerability factor within our identified subset of 'L–K' patients. Again, 'lack of emotional support' was the most predominant example of an 'L–K' link, with the majority (71%) of patients who experienced a 'lack of emotional support' vulnerability ('lock') also nominating the same trigger ('key') to their depression in adulthood. This finding relates to one previously reported by Brown *et al.* (1986), whereby the significance of 'poor emotional and social support in a time of crisis' was shown to be a dominating depressogenic stressor. They found that lack of support from a close partner was associated with a significantly increased risk of subsequent depression once a stressor had occurred and that lack of actual support from a partner at the time of crisis was highly associated with an increased risk of depressive symptoms. Henderson *et al.* (1981), however, proposed that any 'protective' influences provided by an individual's social environment can be less efficacious when compared with the consequences of long-term intra-

personal or constitutional factors. This view (which concedes a variety of factors as potentially mediating links between the initial adverse circumstances and the later life event stressors) must be conceded within any 'L–K' model.

Despite limitations noted, we suggest that our examples of representative sequences provide some indirect support for an 'L–K' model. Our quantitative analyses were designed to overcome many of the potential response biases that could have influenced our qualitative analyses. Here the data set involved the subjects' own quantification of sets of anomalous parental experiences and depressogenic stressors, thus avoiding interviewer and rater biases. Establishment of any links could still reflect biases – but here effected by the patient, whereby a general cognitive set or bias could cause patients to rate earlier parenting and recent stressors according to their attributional style, so generating associations.

As in our qualitative analyses, we found limited evidence to support a 'L–K' hypothesis, albeit one that requires some modification. Intercorrelation of individual 'locks' and 'keys' suggests that narrow specific links are unlikely. The strongest link involved 'learned helplessness', a construct which is conceptually broad and possibly interpreted (and rated) by patients as more of a characteristic of depression or a cognitive schema rather than a stressor *per se*. As noted earlier, the need to provide some patients with an explanation for this term may have had a biasing effect and contributed to the high correlation. However, our data could suggest a multi-associational effect of learned helplessness that fits in well with its theory of defining unpredictable and threatening stressors providing circumstances over which the recipient feels they have no control (Nolen-Hoeksema *et al.* 1986). Thus, our data could be interpreted as demonstrating how many past 'locks' can be conceptually responsible for learned helplessness and link with 'future' keys which produce the same learned helplessness deficits (i.e. powerless/under-responsiveness/ sense of no control). Loss of a parent by death was not linked with any key, perhaps because we failed to include 'death of a partner' as a key or because it was a rare event.

'Link' specificity *v.* general diatheses

Here we focus on our molar 'lock' and 'key' analyses. While the first three factors accounted for substantive percentages of the variances for locks (i.e. 63%) and keys (i.e. 56%), regrettably (but hardly surprisingly) identical constructs were not identified, so reducing or nullifying the chance of demonstrating links. Further studies of this nature might need to explore whether our findings reflect a reality (i.e. that few adverse developmental vulnerability factors appear to effect specificity to depressogenic stressor) or, if there is truly greater specificity than suggested by our study, ensure that consolidated 'K' and 'L' constructs mirror each other more closely.

Despite discordance of factors across the two sets, we obtained informative broad results – that is, there can be no simple conclusion that 'locks and keys' have specificity or not, and instead, that there may be several distinctly differing mechanisms. When we limited consideration to a subset of those rated by the interviewing psychiatrists as evidencing a 'L–K' link, we found several patterns to our quantitative data. First, the suggestion of a general vulnerability effect, whereby exposure to 'insecure' parenting was linked similarly to each of the three molar triggers. Secondly, evidence of some specificity, with abusive parenting more closely associated with abusive and dangerous life event stresses. Finally, we found no clear evidence linking parental loss with any key. Thus, any 'L–K' hypothesis should not be viewed as an 'all or none' phenomenon in terms of specificity.

'Links' and depressive subtypes

Both the qualitative and quantitative analyses suggested that links may be more prevalent and/or stronger in – although not restricted to – the non-melancholic depressive disorders. In the quantitative analyses, links were clearly stronger for those with 'reactive' rather than 'neurotic' depression. As 'reactive depression' is a condition generally weighting the relevance of life event precipitants, an important question is raised. Thus, to what extent is this condition a reaction to a severe stressor or, instead, a reaction to a specifically salient stressor? While such a diagnosis has conventionally been applied

when a depressed mood follows a severe life event, we propose that the reactive depressive response may have a 'foundation' vulnerability component (or 'lock'), and with that vulnerability more likely than for the other disorders to be activated by mirroring stressors.

Final conclusions

We have examined a long-held concept, albeit framed under a wide range of theoretical views, implicating some continuity between adverse early developmental events (and particularly those effected by parents) that may lay down a vulnerability that is then more likely to be activated by life event stressors that share similar constructs or 'meanings'. Such a view has commonly been put by clinicians and theoreticians, but has received little empirical consideration. We believe that our exploratory qualitative and quantitative analyses complement each other and suggest that a 'L–K' hypothesis may be of some relevance to episode onset in a percentage who develop depression but that there is likely to be considerable variation in specificity of any links, and for multiple reasons.

In their daily practice, clinicians formulate factors that describe why patients have decompensated as a consequence of vulnerabilities and life event stressors. Such formulations commonly impute direct pathways with a high weighting to the concept of specificity. Our analyses, while conceding a range of response biases, suggest that the issue is a complex one but worthy of close research attention. Even if links are identified, their nature must be pursued, particularly to establish whether they reflect structurally-based cognitive schemas that develop as a consequence of early adversity, are driven by higher-order variables (e.g. personality style, linguistic categories) or otherwise determined. Further research building on this exploratory study would need to examine ways in which antecedent developmental and depressogenic stressors can best be rated and measured validly and independently, and include formal reliability estimates, before firm conclusions can be drawn about issues of continuity and specificity as well as underlying mechanisms.

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