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5 Multiple traumatic experiences, 6 post-traumatic stress disorder and 7 offending behaviour in female 8 prisoners 9

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28 ABSTRACT

29 **Background** *Although it is well established that prisoners commonly have histories of* 
30 *childhood trauma, little is known about mediators between exposure to trauma and*
31 *criminal behaviour.*

32 **Hypotheses** *We hypothesised that the experience of trauma in adulthood, post-*
33 *traumatic stress disorder (PTSD) and emotional dysregulation would mediate the*
34 *relationship between childhood traumatic events and later criminal behaviour.*

35 **Methods** *Eighty-nine female prisoners were interviewed using standardised scales, in a*
36 *cross-sectional study design. History of traumatic events, DSM-5 PTSD and emotional*
37 *regulation were assessed, along with offending and demographic information. A series of*
38 *regression and mediation analyses were undertaken on the data.*

39 **Results** *Almost all (91%) of the 89 women reported both childhood and adulthood*
40 *trauma. Over half (58%) met the criteria for DSM-5 PTSD. Multiple traumas were*
41 *significantly associated with seriousness of offence, as indicated by sentence length.*
42 *Adult experience of trauma was the only significant mediator between childhood trauma*
43 *and subsequent offending.*

44 **Conclusions/implications for practice** *Women who have experienced multiple*
45 *traumatic events may be more likely to commit serious offences, so it is very important*
46 *to assess and meet their trauma-related needs. While prisons should never be used as*
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substitutes for healthcare facilities, when women or girls are sent to prison, the opportunity for constructive interventions must be seized. Copyright © 2017 John Wiley & Sons, Ltd. Q5

Introduction

Research consistently shows that prisoners have extensive histories of psychological trauma prior to incarceration (Gibson et al., 1999), including childhood trauma (Weeks and Widom, 1998) and subsequent psychopathology (Driessen et al., 2006). A history of multiple trauma is common (Dudeck et al., 2011). Akyüz et al. (2007), in a sample of 101 prisoners, reported that about two-thirds had a lifetime diagnosis of post-traumatic stress disorder (PTSD), but figures on prevalence have been wide ranging. A diagnosis of PTSD according to DSM-III-R, DSM-IV or ICD-10 criteria among sentenced prisoners has been reported as affecting between 4% and 66% across studies (Goff et al., 2007; Akyüz et al., 2007; Dudeck et al., 2011). There is evidence to suggest that PTSD remains undiagnosed and untreated in prisoners (Wolff et al., 2009). Female-prisoners present with higher rates of PTSD than do male prisoners and also report more complex histories of lifetime interpersonal sexual trauma (Komarovskaya et al., 2011). This is important in itself but also because PTSD may interfere with the ability to benefit from rehabilitative programmes, may have an impact on impulse control (Cauffman et al., 1998) and may be associated with higher recidivism rates (Kubiak, 2004). Q6
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Although there is adequate evidence to suggest that psychological trauma is associated with criminal behaviour, the pathways leading to criminal behaviour after childhood psychological trauma have been less well investigated. Hammersley (2011), for example, suggested that substance misuse mediates the relationship between traumatic life events and criminal behaviour, while the persisting effects of childhood trauma predispose to substance misuse as a coping mechanism. Thus, a vicious cycle of substance misuse and offending behaviour may be established (Reckdenwald et al., 2014). It has also been proposed that PTSD may mediate the relationship between traumatic life events and criminal behaviour, as the behavioural sequelae of PTSD include aggressive, hostile and violent behaviour (Donley et al., 2012). It has also been shown, however, that aggression following childhood trauma is independently associated with increased criminal behaviour (Sarchiapone et al., 2009). Furthermore, there is evidence to suggest that maltreated, abused or neglected children experience numerous emotional regulation difficulties with regard to recognising, understanding and expressing their emotions (Toth et al., 2011). Finally, previous exposure to trauma has been shown to signal a greater risk of PTSD from subsequent trauma in adulthood (Breslau et al., 2014).

Our first hypothesis for the present study was that childhood trauma would be associated with a higher rate of experience of adulthood trauma, DSM-5 PTSD and emotional dysregulation and with subsequent and more serious criminal behaviour at an earlier age than among non-traumatised offenders. Our second hypothesis was that the combination of adulthood life events, severe PTSD and emotional dysregulation will constitute a mediator of any relationship between childhood life events and age and seriousness (as indicated by sentence length) of first offence.

Method

Ethics approval for the study was granted by the local NHS Committee and the Prison Service Committee.

Participants

Women were drawn from a single Scottish prison with an average daily population of 378. The total female prisoner population in Scotland at the time of recruitment was 432 (The Scottish Government, 2015). Inclusion criteria were age 18–65, serving a sentence of at least 6 months, being willing to participate voluntarily and to give written consent, emotionally stable enough to cope with the demands of the interview according to the healthcare team and unmedicated or on a stable dose of medication for at least 6 weeks (according to medical records). Exclusion criteria were evidenced, according to clinical interviews noted in the medical record, of learning disability, current suicidal ideation or intent, history of psychosis, current major depressive or simply being judged clinically as too emotionally or physically frail to participate in research.

Procedure

Potential participants, identified by psychiatry trainees in consultation with prison staff, were initially approached by the prison healthcare staff, who introduced the study orally and in writing. During the recruitment period, 100 (26%) of the resident women were invited to participate. Those who were not invited were considered by staff not to fit inclusion criteria or to be too unwell to make valid consent or to participate. Those approached were told that neither participation nor non-participation in the study would affect their routine care and management and that, if they did agree to be enrolled in the study, they would be able to withdraw from the study at any stage without consequence; they were also advised on how to make a complaint about their participation if they wished. They were allowed at least 24 h to consider participation and encouraged

to ask anything they wished about the research. Once consent had been obtained, a mutually convenient time was arranged for an initial appointment with the clinical trainee researcher, who formally checked the consent. ~~Still~~ consenting prisoners were then interviewed by clinical researcher.

Measures

Demographics and medical history were recorded during interview and included age, educational status, marital status, prison sentence, and forensic history (including age of first offence, age of first custody, number of times in custody, number of times in remand, sentence length in months, history of psychological intervention and current use of psychotropic medication).

The Childhood Trauma Questionnaire (CTQ; Bernstein and Fink, 1998) is a 28-item self-report questionnaire about history of childhood sexual, physical and emotional abuse and physical and emotional neglect. Each of the subscales has five items, on which respondents are asked to rate the frequency, on a 5-point scale, with which they experienced each during their childhood, ranging from 'never true' to 'very often true'. Cut-off scores for the presence of each trauma category were used, in accordance with the manual, and childhood trauma was considered present when a participant exceeded this threshold in one or more categories. The instrument has adequate reliability and validity (Bernstein et al., 2003).

The Life Events Checklist (LEC; Gray et al., 2014) is a 17-item, self-report Q9 measure designed to screen for potentially traumatic events in the respondent's lifetime. Sixteen of the items refer to specific event types and one to any other extraordinarily stressful event not captured in the first 16 items. For each item, the respondent checks whether the event (1) happened to them personally, (2) they witnessed the event, (3) they learned about the event, (4) they are not sure if the item applies to them or (5) the item does not apply to them. For our study, we coded the items as 'happened to me' or 'did not happen to me', where the latter encompassed any response other than direct personal involvement. The total number of life events was calculated and used in analyses. The LEC has adequate reliability and validity (Gray et al., 2014).

Post-traumatic Stress Disorder Checklist (PCL-5; Weathers et al., 2013) is a self-report 20-item standardised questionnaire, which assesses DSM-5 post-traumatic symptoms (e.g. intrusive memories). Participants respond on a 5-point scale, ranging from 'not at all' to 'extremely' as to how much the specific symptom was a problem for them over the past month. Scores are added up to calculate a total severity score from 0 to 80, and a provisional PTSD diagnosis is made by scoring 2 or higher on each of the four PTSD criteria items (i.e. re-experience, avoidance, hyperarousal and alterations in cognitions and mood) or a total of 33 or above. The PCL-5 has excellent reliability and validity across a range of populations (e.g. Bovin et al., 2016).

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4 The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)
5 is a 36-item self-report measure for assessing difficulties in regulating emotions.
6 Each item is rated a 5-point Likert scale, from 'almost never' to 'almost always'.
7 A high score is indicative of difficulties in engaging in adaptive emotion-
8 regulation strategies. There is no official cut-off score. The DERS has excellent
9 internal consistency and good construct validity (Fowler et al., 2014). Q10

11 *Data analysis*

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13 A series of one sample *t*-tests were conducted to test for associations between
14 offence history and PTSD status. In order to test the role of reported adulthood
15 traumatic events, emotional dysregulation and PTSD as mediators between
16 reported childhood trauma and criminal behaviour, the process macro for SPSS
17 (Hayes, 2013) was used. Examination of the bootstrapped (1000 iterations)
18 confidence intervals and the Sobel test *p* value allowed the determination of
19 the presence of any indirect effects.

20 To explore the mediating role of adulthood events, emotional dysregulation
21 and PTSD in the relationship between childhood life events and criminal
22 behaviour four models were tested (MacKinnon et al., 2002): (1) independent
23 variables are associated with mediators; (2) independent variables are associated
24 with dependent variables; (3) mediators are associated with dependent variables
25 while controlling for independent variables; (4) the effect on independent
26 variables of controlling for mediators. To support these conditions, bootstrapped
27 values for 95% confidence intervals were obtained for the proposed mediators,
28 using the process macro for SPSS (Hayes, 2013).

31 **Results**

32 *Sample characteristics*

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34 Eleven women preferred not to join the study, leaving 89 participants. The mean
35 age of participants was 34.5 years [standard deviation (SD) = 9.97]. Most were
36 White British ($n = 86$, 94.5%). The majority were unemployed at the time of
37 offence ($n = 72$, 81%), parents ($n = 64$, 72%) and single ($n = 64$, 72%). Most
38 were taking psychotropic medication ($n = 53$, 60%), and most had had contact
39 with psychiatric services prior to imprisonment ($n = 51$, 57%).

40 The most common form of childhood trauma reported was childhood neglect
41 ($n = 70$, 79%), followed by emotional abuse ($n = 69$, 77%), physical neglect
42 ($n = 58$, 65%), sexual abuse ($n = 45$, 51%) and physical abuse ($n = 53$, 60%).
43 The majority ($n = 49$, 55%) reported multiple childhood traumas. The most
44 commonly reported adulthood traumatic experiences were physical assault
45 ($n = 67$, 75%), unwanted sexual experience ($n = 48$, 54%), assault with a weapon
46 ($n = 46$, 52%) and serious harm caused to someone else ($n = 44$, 49%). Other
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types of adulthood life events were less prevalent, although most women reported experiencing multiple life events ($n = 75, 84\%$). Participants reported a mean of 4.96 ($SD = 2.81$) traumatic life events. Eighty-one (98%) participants had experienced both childhood and adulthood events.

DSM-5 post-traumatic stress disorder and symptom endorsement

Over half of the women (52, 58%) met full diagnostic criteria for DSM-5 PTSD. Criterion A, the nature of the traumatic event was recorded as previously mentioned; means and SDs for the indicators of severity were Criterion B intrusion, 13.10 (4.23); Criterion C, avoidance, 5.85 (1.47); Criterion D, alterations in mood and cognition, 19.67 (4.20); and Criterion E, alterations in arousal and reactivity, 15.63 (4.08). Those with PTSD reported a significantly higher mean number of life events (8.04, $SD = 2.47$) compared with those who did not have PTSD (4.74, $SD = 3.18$; $t(84) = -5.42, p = 0.001$). For those with PTSD, the most commonly endorsed symptoms were item 4 on the intrusion scale 'feeling very upset when something reminded you of the stressful experience' (34, 65.38%); item 6 on the avoidance scale 'avoiding memories, thoughts, or feelings related to the stressful experience' (37, 71%); item 13 on the alterations in cognition and mood scale 'Feeling distant or cut off from people' (37, 72%); and item 19 on the alterations in arousal and reactivity scale 'having difficulty concentrating' (38, 73%).

Post-traumatic stress disorder status and offence history

Table 1 summarises the association between PTSD status and offence history. Those with PTSD reported having committed their first offence at younger age ($t = 2.27, p = 0.026$) and being younger the first time they were in custody,

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Table 1: PTSD status, sample characteristics and offence history

Offence characteristics	PTSD	<i>n</i>	Mean (SD)	<i>t</i> (df)	<i>p</i>
Age at first offence	Yes	52	22.3 (10.1)	2.27 (82)	0.026*
	No	32	27.9 (12.0)		
Age at first custody	Yes	51	24.8 (9.3)	2.99 (80)	0.004*
	No	31	31.8 (11.3)		
Number of times in custody	Yes	51	3.3 (5.8)	-1.92 (64.55)	0.059
	No	32	1.6 (1.8)		
Number of times on remand	Yes	48	4.2 (11.6)	-1.99 (49.60)	0.053
	No	30	0.8 (1.5)		
Sentence length in months	Yes	52	70.3 (64.7)	-1.80 (79.35)	0.075
	No	33	47.6 (50.5)		

[Q11]Note: PTSD, post-traumatic stress disorder; SD, standard deviation; df, degrees of freedom.

($t = 2.99, p = 0.004$) than did those without. There was no relationship between having PTSD and number of times in custody, number of times on remand or length of current sentence.

Mediators of the relationship between childhood trauma and offence history

To explore the possibly mediating roles of adulthood events, emotional dysregulation and PTSD in the relationship between childhood life events and criminal behaviour, four conditions were tested (MacKinnon et al., 2002). Firstly, potential predictors are associated with mediators; secondly, potential predictors are associated with outcome variables; thirdly, mediators are associated with outcome variables while controlling for predictors; and finally, the impact of predictors is significantly less after controlling for mediators. To support these conditions, bootstrapped values for 95% confidence intervals were obtained for the proposed mediators, using the process macro for SPSS (Hayes, 2013).

For condition 1, the proposed trauma predictor 'CTQ Total' was regressed onto the proposed life events mediator 'LEC Total' while controlling for age. The relationship was significant ($B = 0.467, p = 0.001$). For condition 2, 'CTQ Total' was regressed onto the outcome variables 'sentence length in months' and 'age at first offence', individually, while controlling for age. 'Sentence length in months' was not associated with 'CTQ Total' ($B = 0.199, p = 0.067$). 'Age at first offence' was significantly associated with 'CTQ Total' ($B = -0.187, p = 0.020$). In condition 3, 'LEC Total' was regressed onto 'sentence length in months' and 'age at first offence' while controlling for age; the relationship to sentence length was significant ($B = 0.341, p = 0.002$) but that with age at first offence was not ($B = -0.158, p = 0.054$). As the latter only just fell short, however, this variable was retained in further analyses. For condition 4, the relationship meeting the preceding three conditions for mediation was assessed for strength. 'CTQ Total' was regressed onto 'sentence length in months' and 'age at first offence', while controlling for age. The mediator, 'LEC Total', previously found to be associated with both 'predictor' and outcome variables was then added into the model. The changes are shown in Table 2.

T2

After establishing changes in each relationship and after controlling for the proposed mediators, a bootstrap analysis of the direct and indirect effects of proposed predicting and mediating variables on the outcome variables provided clarity on the significance of these changes, as shown in Table 3. Where the confidence intervals contain a zero value, there is no effect.

T3

Figure 1 summarises the outcome of the analyses. Childhood trauma (CTQ Total) was associated with younger age at first offence but also with total number of life events. The life events total was also, however, associated with the other outcome variable, length of sentence. The relationship between predictor and outcome variable was strengthened by the inclusion of the mediator. Once these conditions were met, the qualifying relationships were

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Table 2: Changes in B value for each relationship when 'LEC Total' is controlled for, demonstrating its potential role as a mediator

Established relationships	Initial strength		Strength when controlling for 'LEC Total'		Independent effect of 'LEC Total'	
	B	p	B	p	B	p
'CTQ Total' and 'Sentence Length in Months'	0.199	0.067	0.049	0.677	0.317	0.010
'CTQ Total' and 'age of offence'	-0.187	0.020	-0.146	0.112	-0.086	0.349

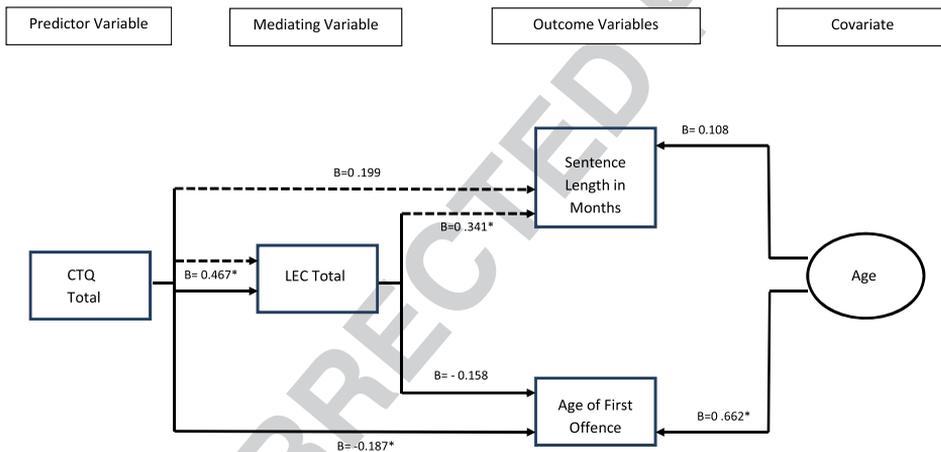
Note: LEC, Life Events Checklist; CTQ, Childhood Trauma Questionnaire.

Table 3: Direct and indirect effects of mediator variables with bootstrapped confidence intervals

Relationship	Mediator	Bootstrapping (1000)	
		Lower 95% confidence interval	Upper 95% confidence interval
'CTQ Total' and 'sentence length in months'	LEC Total	0.101	0.653
'CTQ Total' and 'age of offence'	LEC Total	-0.054*	0.013*

Note: LEC, Life Events Checklist; CTQ, Childhood Trauma Questionnaire.

*Where the confidence intervals contain a 0.0 value, this mediator has a non-significant effect.



Note: * $p < 0.05$

The dotted lines signify the relationship from CTQ to Sentence Length in Months

The solid lines signify the relationship from CTQ to Age of First Offence

Figure 1: The mediating role of adult life events between child trauma and age of first offence and length of criminal sentence. CTQ, Childhood Trauma Questionnaire; Life Events Checklist [Colour figure can be viewed at wileyonlinelibrary.com]

identified and further investigated through bootstrapping procedures. Inspection of confidence intervals (Table 3) revealed a significant indirect effect of the life events total on the relationship between CTQ Total and sentence length in months but not for age at first offence. These associations are displayed in Figure 1. Emotional regulation (according to DERS) and PTSD severity (according to PCL-5) were also tested as mediators in the same manner and were not found to mediate the relationship between childhood trauma and later criminal behaviour.

Discussion

Our findings suggest that DSM-5 PTSD symptoms are very common among female prisoners but do not mediate the relationships between childhood trauma and sentence length or age at first offence nor did emotional regulation. It was surprising that neither emotional regulation nor PTSD severity was found to mediate this relationship considering previous evidence (Toth et al., 2011; Donley et al., 2012), although their possible mediating roles between childhood trauma and offending have never been investigated before in a single study. Instead, we found that adulthood psychological trauma was the only significant mediator in the relationship between childhood trauma and subsequent offending behaviour, specifically as indicated by sentence length.

Although trauma in adulthood was the only significant mediator, it is important to stress that a statistically significant association between PTSD status and age at first offence was found, before allowance for other variables. These findings, coupled with the experience of multiple potentially traumatic life events, provide support for an adversity-related stress model ~~for understanding female prisoners~~, which suggests an association between number of traumatic life events and emergence of a DSM-5 PTSD diagnosis (Warren et al., 2009). Multiple traumas are associated with more complex traumatic presentations, as described in recent ICD-11 proposals (Karatzias et al., 2016) rather than simple PTSD, which was investigated as a mediator in the present study. The proposed PTSD diagnosis, as described in ICD-11, describes three symptoms additional to those specified in DSM-5. These are affect regulation, impaired self-concept and interpersonal difficulties (Maercker et al., 2013). There is now evidence to suggest that multiple traumas over time, as experienced by these women in prison, are more strongly predictive of complex PTSD than DSM-5 PTSD (Cloitre et al., 2013). We did not assess for complex PTSD, but this would be worth doing in future studies.

Another important finding from our study is that multiple experiences of trauma were significantly associated with the severity of the most recent offence, as measured by length of sentence but not with age at first offence. In other words, multiple traumatisation may not necessarily lead directly to criminal behaviour, but when a multiply traumatised person commits an offence, that offence may be more serious. There is evidence to suggest that traumatisation is associated with aggressive, hostile and violent behaviour (Sarchiapone et al., 2009; Donley et al., 2012).

Our study had a number of limitations including the fact that assessment of childhood and lifetime trauma was retrospective, although data were collected in an interview format to enhance reliability and validity of responses. Our sample was small and confined to women serving prison sentences in excess of 6 months. Duration of current sentence was considered an index of offence severity rather than longest period of imprisonment during lifetime. All prisoners

in the sample, however, had a sentence of 6 months or more, while two-thirds of the Scottish prison population were serving less when recruitment took place. This suggested that our sample included those with more serious recent offences.

Considering that experience of multiple traumas may be the key to understanding more serious offences by women, attention should be given to the more specific trauma-related needs of this group. Imprisonment may provide an opportunity for stability for those whose lifestyles outside prison are often chaotic and thus also accurate assessment of need to inform accurate choice of interventions to improve recovery from psychological trauma. Our findings may suggest that targeting emotional regulation and traumatic symptoms alone in this population group will not necessarily reduce recidivism. There is now an emerging evidence of psychotherapies better suited to states associated with ~~multiple childhood trauma~~, such as cognitive processing therapy or the Skills Training in Affect and Interpersonal Regulation narrative therapy for non-offenders (Cloitre et al., 2010; Matulis et al., 2014). Future research should [Q12](#) evaluate the acceptability and efficacy of such interventions of complex PTSD in prisoners.

Conclusion

Women in prison have extensive trauma histories in childhood and in adulthood, most experiencing subsequent post-traumatic stress symptoms ~~and many complex PTSD~~. Such experiences may contribute to the extent and/or seriousness of their offending. Attention should, therefore, be paid to more detailed assessment of trauma-related needs among such women, with the aims of both improving their mental health and reducing their offending behaviours.

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Whether you opt for hard-copy or electronic annotation of your proofs, we recommend that you provide additional clarification of answers to queries by entering your answers on the query sheet, in addition to the text mark-up.

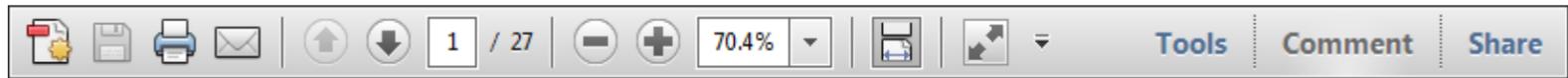
Query No.	Query	Remark
Q1	AUTHOR: Please confirm that given names (red) and surnames/family names (green) have been identified correctly.	
Q2	AUTHOR: Please verify that the linked ORCID identifiers are correct for each author.	
Q3	AUTHOR: Please check that authors' affiliations are correct.	
Q4	AUTHOR: Keywords section has been deleted because as per TSS, keywords are not applicable for this journal.	
Q5	AUTHOR: "...when women or girls are sent..." This sentence has been reworded for clarity. Please check and confirm it is correct.	
Q6	AUTHOR: The citation "Akyuz et al. (2007)" has been changed to "Akyüz et al. (2007)" to match the author name/date in the reference list. Please check if the change is fine in this occurrence and	

Query No.	Query	Remark
	modify the subsequent occurrences, if necessary throughout the text.	
Q7	AUTHOR: Reference "Goff et al., 2007" has been cited in the text but not mentioned in the Reference List. Please provide the publication details in the Reference List or delete the citation from the text.	
Q8	AUTHOR: The citation "Wolff et al., 2014" has been changed to "Wolff et al., 2009" to match the author name/date in the reference list. Please check if the change is fine in this occurrence and modify the subsequent occurrences, if necessary.	
Q9	AUTHOR: The citation "Gray et al., 2004" has been changed to "Gray et al., 2014" to match the author name/date in the reference list. Please check if the change is fine in this occurrence and modify the subsequent occurrences, if necessary. Throughout the text.	
Q10	AUTHOR: The citation "Fowler et al, 2004" has been changed to "Fowler et al., 2014" to match the author name/date in the reference list. Please check if the change is fine in this occurrence and modify the subsequent occurrences, if necessary.	
Q11	AUTHOR: Degrees of freedom. Is this the correct definition for df? Please change if this is incorrect.	
Q12	AUTHOR: "Future research should evaluate..." This sentence has been reworded for clarity. Please check and confirm it is correct.	
Q13	AUTHOR: Reference "Ruggiero et al, 2003" is not cited in the text. Please indicate where it should be cited; or delete from the reference list and renumber the references in the text and reference list.	

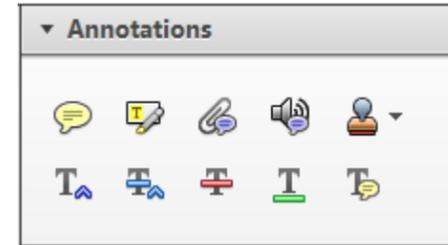
Required software to e-annotate PDFs: **Adobe Acrobat Professional** or **Adobe Reader** (version 7.0 or above). (Note that this document uses screenshots from **Adobe Reader X**)

The latest version of Acrobat Reader can be downloaded for free at: <http://get.adobe.com/uk/reader/>

Once you have Acrobat Reader open on your computer, click on the **Comment** tab at the right of the toolbar:



This will open up a panel down the right side of the document. The majority of tools you will use for annotating your proof will be in the **Annotations** section, pictured opposite. We've picked out some of these tools below:



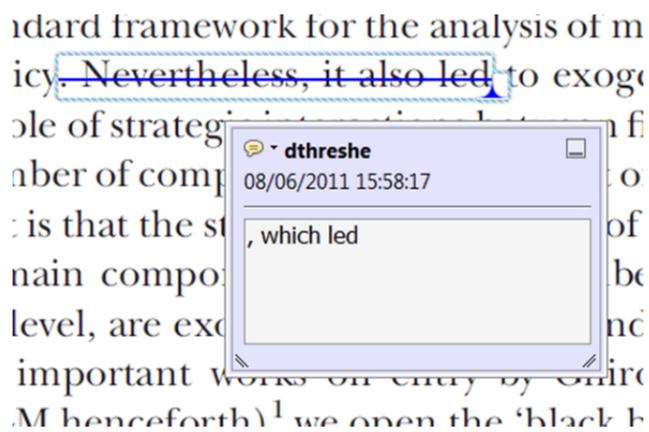
1. Replace (Ins) Tool – for replacing text.



Strikes a line through text and opens up a text box where replacement text can be entered.

How to use it

- Highlight a word or sentence.
- Click on the **Replace (Ins)** icon in the Annotations section.
- Type the replacement text into the blue box that appears.



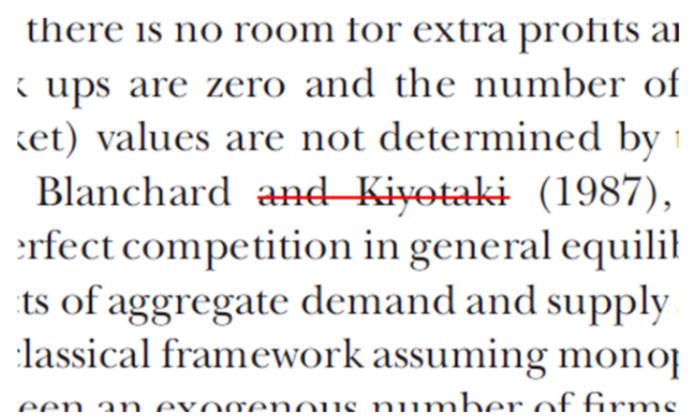
2. Strikethrough (Del) Tool – for deleting text.



Strikes a red line through text that is to be deleted.

How to use it

- Highlight a word or sentence.
- Click on the **Strikethrough (Del)** icon in the Annotations section.



3. Add note to text Tool – for highlighting a section to be changed to bold or italic.

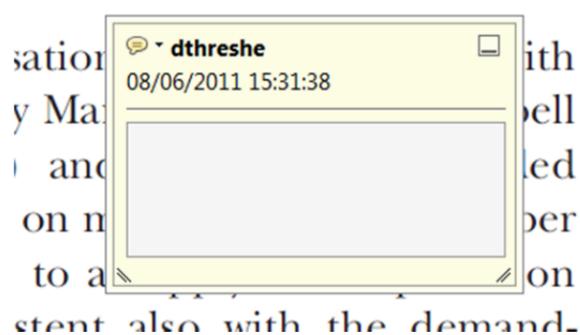


Highlights text in yellow and opens up a text box where comments can be entered.

How to use it

- Highlight the relevant section of text.
- Click on the **Add note to text** icon in the Annotations section.
- Type instruction on what should be changed regarding the text into the yellow box that appears.

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ent with the **VAR** evidence



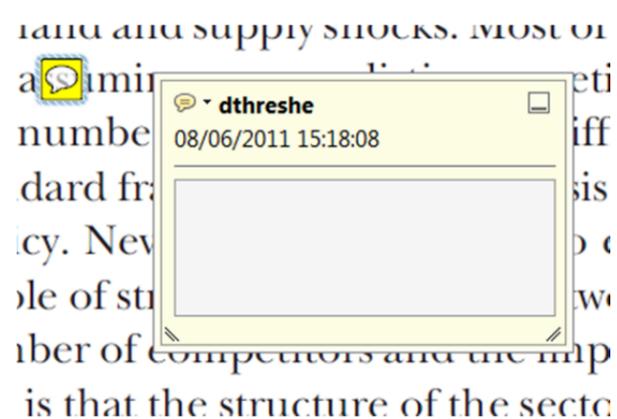
4. Add sticky note Tool – for making notes at specific points in the text.



Marks a point in the proof where a comment needs to be highlighted.

How to use it

- Click on the **Add sticky note** icon in the Annotations section.
- Click at the point in the proof where the comment should be inserted.
- Type the comment into the yellow box that appears.



USING e-ANNOTATION TOOLS FOR ELECTRONIC PROOF CORRECTION

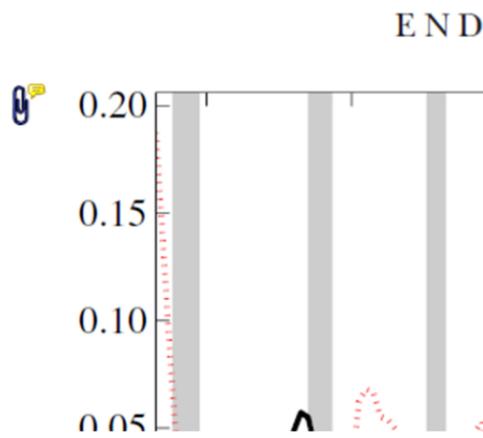
5. Attach File Tool – for inserting large amounts of text or replacement figures.



Inserts an icon linking to the attached file in the appropriate place in the text.

How to use it

- Click on the [Attach File](#) icon in the Annotations section.
- Click on the proof to where you'd like the attached file to be linked.
- Select the file to be attached from your computer or network.
- Select the colour and type of icon that will appear in the proof. Click OK.



6. Add stamp Tool – for approving a proof if no corrections are required.



Inserts a selected stamp onto an appropriate place in the proof.

How to use it

- Click on the [Add stamp](#) icon in the Annotations section.
- Select the stamp you want to use. (The [Approved](#) stamp is usually available directly in the menu that appears).
- Click on the proof where you'd like the stamp to appear. (Where a proof is to be approved as it is, this would normally be on the first page).

of the business cycle, starting with the
 on perfect competition, constant return
 production. In this environment goods
 extra profits and the number of firms
 he number of firms is determined by
 determined by the model. The New-Key
 otaki (1987), has introduced produc
 general equilibrium models with nomin
 ed and supply shocks. Most of this literat

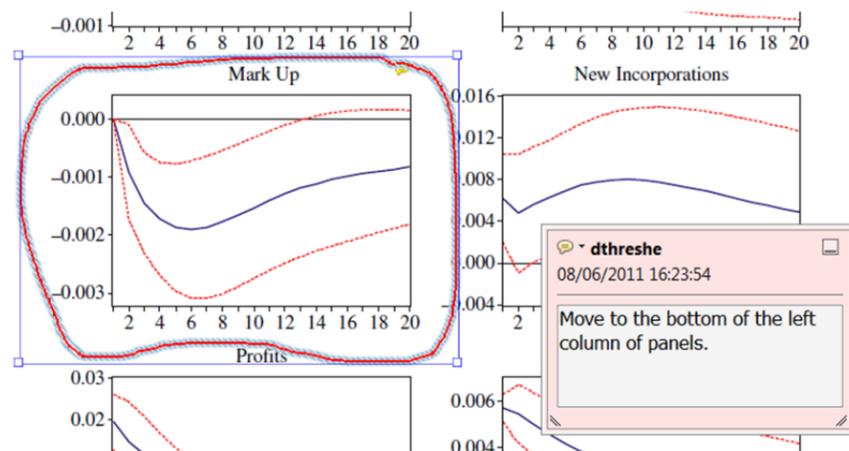


7. Drawing Markups Tools – for drawing shapes, lines and freeform annotations on proofs and commenting on these marks.

Allows shapes, lines and freeform annotations to be drawn on proofs and for comment to be made on these marks..

How to use it

- Click on one of the shapes in the [Drawing Markups](#) section.
- Click on the proof at the relevant point and draw the selected shape with the cursor.
- To add a comment to the drawn shape, move the cursor over the shape until an arrowhead appears.
- Double click on the shape and type any text in the red box that appears.



For further information on how to annotate proofs, click on the [Help](#) menu to reveal a list of further options:

