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An experimental trauma film study to investigate to investigate the role of peri-traumatic cognitive processing on post-event PTSD symptoms and trauma memory

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Volume I

SYSTEMATIC REVIEW,

MAIN EMPIRICAL PROJECT

&

SERVICE EVALUATION PROJECT

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Philippians 4:13

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SYSTEMATIC REVIEW

A systematic review exploring the mechanisms by which "abstract" and "concrete" processing styles have an effect on outcomes in trauma-exposed individuals

Primary supervisor: Dr Jennifer Wild

Secondary supervisor: Dr Patrick Smith

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ABSTRACT

BACKGROUND: In recent years there has been emerging empirical support for the hypothesis that the mode of processing adopted in relation to trauma can impact upon outcomes in trauma-exposed individuals. Specifically "abstract" and "concrete" cognitive processing styles have been found to exert negative and positive outcomes respectively. However, at present the mechanisms by which these processing modes exert their effects on outcomes remains unclear.

OBJECTIVES: By means of a systematic narrative review, we investigated the effects of "abstract" and "concrete" cognitive processing styles on outcomes in trauma-exposed individuals, and looked for evidence of the possible mechanisms by which these processing modes may be operating.

METHODS: A systematic search was conducted using MEDLINE, EMBASE and PsycINFO databases. Studies were eligible for inclusion if they were published in a peer-reviewed journal, conducted on an adult population, included exposure to a trauma or an analogue trauma/stressor, as well as containing a manipulation or measurement of either "abstract" or "concrete" processing.

RESULTS: 12 articles were included in the review, providing data from 14 studies. Eight studies were experimental in design, four were cross-sectional and two were longitudinal. Abstract processing was shown to lower mood, increase intrusions and levels of arousal.

CONCLUSIONS: Abstract processing may be a cognitive avoidance strategy, which hinders the emotional processing of trauma, and thus perpetuates traumatic symptoms. Future studies should examine the effects of processing mode on appraisals of and memory for the trauma in order to shed further light on this cognitive processing mechanism.

1. INTRODUCTION

1.1. Processing mode theory

Accumulating evidence suggests that the mode or style of processing that people adopt when repetitively thinking about negative events is one of the key factors that determines negative outcomes in emotional disorders, alongside valence of the thought content and the context in which it occurs (Watkins, 2008). This theory evolved from studies showing repetitive negative thinking to be a key cognitive process in the onset and maintenance of a range of psychiatric disorders (Ehring & Watkins, 2008; Harvey, Watkins, Mansell, & Shafran, 2004). Studies investigating repetitive negative thinking in the form of worry in generalised anxiety disorder (GAD) and rumination in depression have provided the most empirical support for this hypothesis. More recently, research into rumination in trauma-exposed individuals with persistent PTSD has begun to emerge. In summary, the theory posits that the distinction between "*abstract*" and "*concrete*" cognitive processing can account for the functional and dysfunctional consequences of negative repetitive thought (Stöber & Borkovec, 2002; Watkins & Moulds, 2007).

Various definitions of abstract and concrete processing have been proposed. In relation to GAD, abstract thought processes are defined as being "indistinct, cross-situational, equivocal, unclear and aggregated", whereas concrete thoughts are viewed as "distinct, situationally specific, unequivocal, clear and singular"(Stöber & Borkovec, 2002). The social cognitive literature makes a distinction between *higher-level* and *lower-level* construals of information processing, (Trope & Liberman, 2003; Vallacher & Wegner, 1987), which have been adopted into processing mode definitions of repetitive negative thinking in depression. Abstract-evaluative thinking in the form of rumination has been characterised by high-level construals, which contain general, decontextualised mental representations that convey the essential gist and meaning of events and actions. They tend to consist of '*why?*' and '*what-if?*' questions that have no obvious solution, and are focused on the causes, meanings and implications of events. In contrast, concrete-evaluative thinking is characterised by low-level, specific, contextualised mental representations that convey the incidental details of events and actions. They tend to consist of '*how'* questions that are focused on the direct

experience (including emotions) and the means to the desired ends, e.g. steps needed to achieve an overall goal (Watkins, 2008).

1.2. What are the mechanisms by which processing mode influences outcomes in depression/GAD?

The way in which abstract and concrete processes influence outcomes in psychological disorders has been a matter of theoretical investigation in recent years. Watkins' (2008) comprehensive review of constructive and unconstructive repetitive thinking provides some insight into the potential mechanisms by which processing modes may be operating, as do experimental studies that have manipulated processing modes in non-clinical populations. As previously mentioned, the majority of the experimental literature thus far has been concerned with rumination processes in depression, with a few significant studies on worry in GAD. Therefore the key mechanisms by which processing modes are hypothesised to be operating have been based on these disorders to date. In reviewing the literature on worry and rumination in depression and GAD, there appear to be four competing hypotheses about how processing mode may exert its negative effects in these disorders. A summary of the extant hypotheses is provided below.

1.2.1. Problem solving

One mechanism by which processing mode may exert negative effects is by influencing the efficacy of problem solving. Watkins (2008) argued that concrete processing may provide 'more elaborated and contextual detail about the specific means, alternatives and actions by which to best proceed when faced with difficult, novel or complex situations.' Consistent with this hypothesis, there has been evidence to suggest that when individuals with depression focus concretely on their symptoms, there are improvements in their social problem solving abilities relative to an abstract symptom focus (Watkins & Moulds, 2005). In addition, there is also evidence to suggest that when depressed individuals focus on concrete questions that are intended to increase their awareness of mental processes involved in problem solving, (e.g. "*How am I deciding on a way to solve this problem?*") there are significant improvements in their problem solving abilities relative to questions focused on the cause of problems (e.g. "*What's the reason*

behind all this?") (Watkins & Baracaia, 2002). In this way, the abstract nature of rumination, with its focus on "why" questions without obvious answers, may prevent the individual from finding a suitable solution to their problem.

1.2.2. Self-regulation

Processing mode linked to rumination may also exert its negative effects through self-regulation. Self-regulation is defined as the on-going pursuit of personal goals and evaluation of one's own progress towards these goals (Carver & Scheier, 1990). Leary et al. (2006) argue that abstract construals about the evaluative or interpersonal implications of one's behaviour (e.g. thoughts about the implications of failing to carry out a desired behaviour) interrupt the smooth performance of behaviours, whereas more concrete construals (e.g. thoughts that focus on how to carry out the behaviour) benefit self-regulation by focusing attention on the immediate demands of the present situation, reducing anxiety and using up fewer self-regulatory resources. Support for this hypothesis comes from studies that show high levels of actual-ideal discrepancy and a tendency to ruminate in response to stress and failure results in greater depressive symptoms (Papadakis, Prince, Jones, & Strauman, 2006).

1.2.3. Degree of generalisation

Processing mode may also exert effects by influencing the degree of generalisation in response to emotional events. In depressive rumination, abstract thoughts are seen to produce mental representations that generalize across situations and that fail to incorporate specific contextual details. Watkins (2008) argued that abstract construals could facilitate negative overgeneralisations where a single failure is explained in terms of a global personal inadequacy (e.g. "I am useless") rather than in terms of situation-specific difficulties. In contrast, concrete construals are hypothesised to be more adaptive by reducing negative overgeneralisations. Support for this hypothesis has come from studies that have shown recalling specific, contextualised autobiographical memories reduces the negative impact of a stressful task in contrast to the recall of general, decontextualised memories (Williams, Eelen, Raes, & Hermans, 2006), as well as studies with depressed individuals where adopting a concrete-experiential self-focus (defined as focusing on the direct experience of one's thoughts, feelings and sensations in the present

moment) has been found to be protective against the development of negative global self-judgements (Rimes & Watkins, 2005).

1.2.4. Emotional reactivity

Following on from the generalisation hypothesis, the pathway by which processing mode may influence the extent of generalization may be via emotional reactivity. Emotional reactivity is conceptualized as the change in quality and intensity of affect in response to an emotionally evocative event, such as change in despondency following a failure. In depressive rumination, abstract processing involves predominantly high-level construals about self and mood, and when a negative event occurs, people with this mind-set are more likely to produce negative overgeneralisations ("I always mess up") when focusing on self, problems and feelings. Such overgeneralisations are likely to exacerbate emotional reactivity to subsequent negative events (Wenzlaff & Grozier, 1988). Evidence supporting this hypothesis comes from experimental studies where people high in trait rumination were trained to adopt either abstract or concrete construals and then exposed to a failure. Only abstract processing was found to be related to lower levels of positive affect (Moberly & Watkins, 2006) and therefore, processing mode was said to have moderated the effect of trait rumination on emotional reactivity. A direct effect of processing mode on emotional reactivity has also been shown when Watkins, Moberly and Moulds (2008) trained non-clinical participants in concrete processing and found that this reduced subsequent emotional reactivity to a failure relative to abstract processing.

1.2.5. Emotional processing

With regards to the literature on worry, research has shown that worrisome thoughts in GAD tend to be predominantly abstract in form, and that abstractness of thinking is related to diagnoses of GAD (Stöber & Borkovec, 2002; Stöber, Tepperwien, & Staak, 2000). To make sense of this, Stöber proposed a "reduced concreteness" theory of excessive worry (Stöber, 1998). He argued that worry is primarily a verbal process, consisting of abstract thoughts (i.e. reduced concrete thoughts), which function to reduce aversive imagery (Borkovec, Ray, & Stober, 1998). He suggested that the dominant role of abstract verbal thoughts and the subsequent avoidance of concrete aversive imagery is what keeps worry going.

This is because confrontation of the meaning of the aversive material is needed for successful emotional processing of said material. Successful emotional processing involves activating the emotional memory linked to the imagery, accessing the representations of the stressor, elaborating the stored material and encoding information in memory which is inconsistent with existing emotional structures (Foa & Kozak, 1986). Without concrete emotional imagery to facilitate emotional processing, negative emotional states and heightened physiological responses to fear cues are maintained (Borkovec, Alcaine, & Behar, 2004). This has been shown in experimental research when deliberate worry following exposure to a stressful stimulus resulted in an increase in subsequent intrusive images about the stressor. The authors suggested that emotional processing of the images had been blocked due to the cognitively demanding and predominately verbal activity of worry (Wells & Papageorgiou, 1995). Taken together, this research suggests that one of the mechanisms by which abstract processing may have a dysfunctional effect could be through the blocking of emotional processing of negative material.

1.3. Processing mode theory applied to PTSD

Given the evidence in favour of repetitive negative thinking as a transdiagnostic process (Ehring & Watkins, 2008), it is of no surprise that modes of cognitive processing are being explored transdiagnostically. One emerging area of research is the exploration of the processing mode theory in relation to trauma exposure (Ehring, Frank, & Ehlers, 2008). There is early research evidence to suggest that abstract-evaluative repetitive thinking about trauma and its consequences is responsible for symptom maintenance in PTSD (Michael, Halligan, Clark, & Ehlers, 2007). However, since this is a novel research area, little is known about the mechanisms by which abstract thinking exerts its negative effects in relation to traumatic experiences. It may be the case that abstract and concrete processing influence outcomes in PTSD via some of the same mechanisms identified in depressive rumination and worry (as summarised above), and yet, given the different cognitive models for depression, GAD and PTSD, it seems likely that there might be mechanisms specific to PTSD through which the abstract and concrete processing modes exert their effects.

1.4. Study aims and objectives

The present systematic review aimed to summarise the extant literature on processing mode theory as applied to trauma, and in doing so to answer the following questions:

1) What effects do abstract and concrete cognitive processing styles have on outcomes in trauma-exposed individuals?

2) What does the extant literature have to say about the mechanisms by which abstract and concrete processing modes influence outcomes in trauma-exposed individuals?

2. METHODS

2.1. Study selection criteria

Ehring, Kleim and Ehlers (2011) recently summarised the extant literature on what is known about general cognitive mechanisms in PTSD, and concluded that research studies in this area typically fall into one of two categories. The first category concerns studies of survivors of traumatic events where associations between PTSD and cognitive variables are assessed with questionnaires and/or information processing paradigms. The second group of studies concerns healthy non-traumatized individuals who have been exposed to an analogue stressor and where cognitive variables have been experimentally manipulated to investigate their effects on analogue PTSD symptoms. As the present study was concerned with a specific type of cognitive mechanism in PTSD (namely abstract and concrete processing in relation to trauma), in light of the above, both types of study were included in the present review. The definition of "trauma-exposed" individuals was also kept wide enough to include analogue trauma exposed individuals.

Studies were therefore included in the present review if:

- They were conducted on an adult population (as cognitive processes are still developing in child/adolescent populations and are therefore arguably not comparable to adult cognitive processes)

- The population had been exposed to a trauma or an analogue trauma/stressor (as defined by the authors, but stressors akin to those found in the PTSD population)
- There was a manipulation or measurement of either "abstract" or "concrete" processing in keeping with Watkins' (2008) processing mode theory of repetitive thinking or Stöber's (1998) theory of reduced concreteness.
- The paper was published in a peer-reviewed journal

Studies were excluded from the present review if:

- The sample included individuals under 18
- The population had not been exposed to trauma
- The population had been exposed to a stressor relating to a disorder other than PTSD (e.g. depression, GAD, worry or social phobia)
- There was no manipulation or measurement of either "abstract" or "concrete" processing
- The manipulation or measurement of "abstract" or "concrete" processing was unrelated to Watkins' (2008) processing mode theory of repetitive thinking or Stöber's (1998) theory of reduced concreteness.
- The paper was a review paper, an unpublished manuscript, or conference proceeding

2.2. Information sources

The following databases were searched for relevant studies in March 2015: EMBASE (via Ovid, 1980 to 2015 week 12, 23/03/15); MEDLINE (via Ovid, 1946 to March week 3 2015, 23/03/15); and PsycINFO (via Ovid, 1806 to March week 3 2015, 23/03/15). The databases were selected based on the size and nature of their collections. In addition, further studies were identified by examining the reference lists of all relevant articles, hand searching the *Journal of Behavior Therapy and Experimental Psychiatry* for relevant publications in the last few years given it's focus on experimental tests of psychological approaches to psychopathology, as well as searching the publication lists of frequently cited authors on their research websites (e.g. departmental webpages, ResearchGate.net).

2.3. Search strategy

The search strategy used search terms pertaining to abstract and concrete processing styles and combined these with PTSD *MESH* and *keyword* search term variants (depending on the topic namings found in each database). The search was not limited by type of study or language. An example of the full list of search terms used to search the Ovid databases is provided in Figure 1.

List 1. Abstract and concrete search terms (combined with OR)

"abstract$ *adj3* thought", or "abstract$ *adj3* thinking", or "abstract$ *adj3* process$", or "abstract *adj* evaluative", or "repetitive *adj* thought$", or "repetitive *adj* thinking", or "recurrent *adj* thinking", or "ruminative *adj* thinking", or "unproductive *adj* thought$", or "unproductive *adj* thinking", or "reduced *adj* concreteness", or "trauma *adj* related *adj* rumination", or "trauma$ *adj3* rumination", or "PTSD *adj3* rumination", or "posttraumatic *adj* stress *adj3* rumination", or "cognitive *adj* process$ *adj3* ptsd", or "cognitive *adj* process$ style$", or "processing *adj3* trauma", or "processing *adj3* PTSD", or "rumination/or rumination.mp", or "concrete$ *adj3* thought", or "concrete$ *adj3* thinking", or "concrete *adj* process$", or "concrete *adj* experiential", or "constructive *adj* thought", or "constructive *adj* thinking" or "construal *adj* level" or "level *adj* of *adj* processing"

List 2. Trauma/PTSD search terms (combined with OR)

"trauma$", or "posttraumatic stress disorder/or posttraumatic stress disorder.mp", or "PTSD/or PTSD.mp", or "trauma *adj* exposed" or "analogue *adj* trauma", or "stressful *adj3* event" or "negative *adj3* event".

Lists 1 & 2 (combined with AND)

Figure 1. A full list of the search terms used to identify relevant literature in the Ovid databases (EMBASE, MEDLINE & PsycINFO)

2.4. Study selection

Figure 2 shows a PRISMA (Preferred Reporting Items of Systematic reviews and Meta-Analyses) flow diagram of the study selection process (Moher, Liberati, Tetzlaff, & Altman, 2009). Records identified from the search strategy were

checked for duplicates, and any duplicate records were removed from the search. The titles and abstracts of the remaining records were screened for potential eligibility against the study inclusion/exclusion criteria. Records were not considered for full-text screening and were excluded from the search if there was sufficient information in the abstract to indicate that the record was unrelated to the research question or did not meet inclusion criteria. If there was insufficient information from the abstract in order for the researcher to make an informed decision about eligibility, the full-text of the paper was accessed and screened. At the full-text screening stage, both the first author and a blind independent rater assessed all 26 potentially relevant papers for inclusion. Any disagreement on ambiguous texts was resolved through discussion. Cohen's Kappa was calculated as a measure of agreement between the raters, and was found to be 0.85, which represents almost perfect agreement (Landis & Koch, 1977).

2.5. Data extraction and synthesis

Data was extracted from reports using an extraction instrument that was created for the purposes of the present review. The following variables were extracted and are summarised by type of study in Tables 1 and 2: Author and publication year, country, total number of participants included in the study, percentage female, population, study methodology, experimental conditions, primary outcomes of interest (including measurement tools used), main effects of condition on outcomes or main finding, and conclusions about abstract/concrete processing mechanisms cited in the studies. As this is an emerging area of research, the present systematic review adopted a narrative data synthesis approach, and thus presented a broad picture of the available evidence on this topic to date.

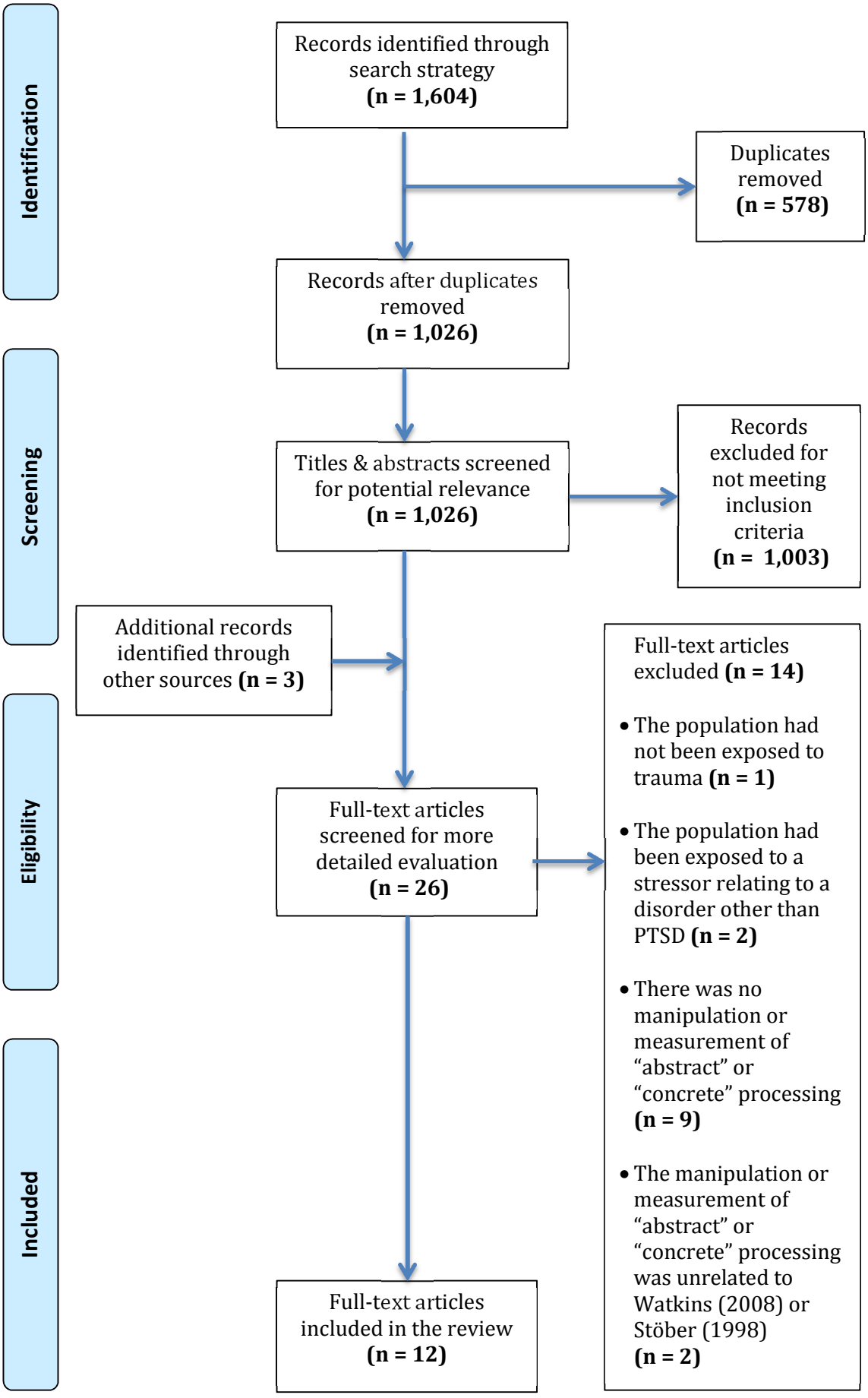

Figure 2. PRISMA flow diagram of study selection process

3. RESULTS

3.1. Summary of study characteristics

Tables 1 & 2 summarise the papers included in the review (see pgs. 40-45). In total, 12 papers were included in the review, with data from 14 studies (two papers reported two studies within one paper). Papers were published between 2007 and 2014. Six studies came from labs or clinics based in the UK, four from the Netherlands, one from the USA, one from Belgium, one from Switzerland and one from Italy. All identified papers were written in English. Eight studies were experimental in design, four were cross-sectional and two were longitudinal. Sample sizes ranged from 51 to 212. Percentages of female participants ranged from 33% to 100%.

Five of the studies recruited traumatized samples, three of which were cross-sectional (Birrer & Michael, 2007; Ehring, Frank, & Ehlers, 2008; Michael, Halligan, Clark, & Ehlers, 2007) and two of which were longitudinal in design (Ehring et al., 2008; Michael et al., 2007). Nine studies recruited non-traumatised participants, eight of which were experimental in design (Ball & Brewin, 2012; Ehring, Fuchs, & Kläsener, 2009; Ehring, Szeimies, & Schaffrick, 2009; Goldwin, Behar, & Sibrava, 2013; Santa Maria, Reichert, & Hummel, 2012; Schaich, Watkins, & Ehring, 2013; Vrielynck, Philippot, & Rime, 2010; Zetsche, Ehring, & Ehlers, 2009), and one of which was cross-sectional (Bassanini, Caselli, Fiore, Ruggiero, Sassaroli, & Watkins 2014)[1].

All cross-sectional studies and longitudinal studies used self-report questionnaires to gather information about abstract and concrete processing from participants, with two of the studies supplementing questionnaires with in-depth interviews (Birrer & Michael, 2011; Ehring et al., 2008). The analogue traumas used in the experimental studies assumed one of two categories: those using the trauma film paradigm and those using participants' real-life distressing experiences. Four of the eight studies (Ball & Brewin, 2012; Ehring, et al., 2009b; Schaich et al., 2013;

[1] There was limited information in Bassanini et al. (2014) to assess whether the "negative everyday scenarios" used in the study were appropriate analogue trauma stressors relevant to our research question. However, we included this paper in the present review based on the example item of 'car accident' given in the paper, which is in keeping with the analogue trauma stimuli used in other included studies.

Zetsche et al., 2009) used a trauma film paradigm (Holmes & Bourne, 2008) to induce analogue trauma symptoms and to test the effect of abstract or concrete processing on these symptoms. The other four studies used participants' own distressing life experiences to the same effect (Ehring, et al., 2009a; Goldwin et al., 2013; Santa Maria et al., 2012; Vrielynck, et al., 2010b). Table 3 provides a summary of the types of analogue trauma stressor used in these experiential studies to provoke analogue PTSD symptoms, as well as specific details of abstract/concrete manipulations or measurements used (see pgs. 46-47).

For the studies using trauma films, three out of four studies used films depicting the aftermath of real-life RTAs (Ball & Brewin, 2012; Ehring et al., 2009b; Zetsche et al., 2009), and one study used a scene from a particularly distressing motion picture (Schaich et al., 2013). The studies using films of RTAs all used films based on an original compilation by Steil (1997), as these have been shown to reliably induce intrusive memories in earlier studies (e.g. Halligan, Clark, & Ehlers, 2002; Holmes, Brewin, & Hennessy, 2004). However, Zetsche et al. (2009) updated some of the German materials to make them more relevant to the UK population. Schaich et al. (2013) used a clip from the film "Irreversible" (showing the raping and beating of a woman) which has been used reliably as an analogue stressor in previous studies (Verwoerd, de Jong, & Wessel, 2008; Verwoerd, Wessel, de Jong, & Nieuwenhuis, 2009) and has also been found to be the most effective motion picture for eliciting stress responses relative to other traumatic films (Weidmann, Conradi, Gröger, Fehm, & Fydrich, 2009).

The studies that used participants' own experiences as analogue stressors were more diverse in their methodology. For example, Ehring et al. (2009) asked participants to identify 'distressing, but non-traumatic life events' which they had to be 'moderately distressed' about at the time of the study (indicated by a rating of at least 2 on a 0-5 scale). The variety of responses included 'relationship difficulties or breakup, serious illness of a loved one, death of a loved one, serious family problems and serious problems at university'. However, Santa-Maria et al. (2012) required the 'distressing life event' to have happened in the last five years, with distress at the time of the event scoring at least 7 out of 10, and 5 out of 10 at the time of the study. The reported negative events fell into similar categories of

'death of a loved one, relationship breakup, illness of a loved one, traffic accident, having been a victim of a crime, and other events.' Vrielynck et al. (2010b) also required participants to have experienced a life event within the last five years, but one which they felt they had not recovered from and some of the features of which they had not previously disclosed. The resultant traumas were: 'death of a relative, relationship break up, professional difficulties, sexual abuse, physical abuse, moral abuse, abortion, vehicle accidents, illness of a relative and other'. The least stringent criteria came from Goldwin et al. (2013), who instructed participants to call to mind a past traumatic event about which they currently think with 'at least some frequency'. The resultant topics were: 'injury/accident, victimization, death, negative interpersonal relationship, illness, suicide, and unspecified/vague-trauma related topic'.

3.2. Quality of the reviewed studies

Due to the different methodologies of the reviewed studies, it was not possible to use a single quality assessment checklist to assess the methodological quality of all the studies. As such, the quality of the experimental, longitudinal and cross-sectional studies was addressed narratively, in line with guidance from Khan, Kunz, Kleijnen and Antes (2011).

3.2.1. Quality of experimental studies

According to Khan et al. (2011) there are four key biases that can impact upon the quality of experimental studies, namely: "selection bias", "performance bias", "measurement bias" and "attrition bias".

Selection bias refers to the systematic differences between comparison groups in responsiveness to experimental manipulation. To assess whether selection bias had been accounted for in the studies reviewed, we examined whether participants had been randomly allocated to their experimental groups, and the extent to which the randomisation process had been described. Seven of the experimental studies contained information about random assignment to groups, and one study allocated participants to groups according to their responses on standardised trait questionnaires (Goldwin et al., 2013). Five of the studies randomly allocated participants to groups, but stratified their assignment by

gender (Ball & Brewin, 2012; Ehring et al., 2009a; Ehring et al., 2009b; Santa Maria et al., 2012; Zetsche et al., 2009). None of the studies provided details of how the random assignment was done, however this is typically more pertinent for clinical randomised controlled trials. Randomisation checks were statistically analysed in the seven studies that used randomisation, and any significant differences that emerged between groups were controlled for in the main analyses. Overall, the selection bias was deemed adequately controlled for in the experimental studies reviewed.

Performance bias refers to the systematic differences in the manipulation provided to the study subjects other than the interventions being evaluated. Although this item is more relevant to clinical interventions and typically refers to the blinding of participants to allocated conditions, we were interested in the standardization of the experimental protocols between comparison groups. All of the experimental studies made attempts to control for performance bias. For example, studies made sure that all participants were given the same instructions (bar processing mode specific instructions)(Ball & Brewin, 2012) and that manipulations lasted the same length of time (Ehring et al., 2009a; Ehring et al., 2009b; Goldwin et al., 2013; Santa Maria et al., 2012; Schaich et al., 2013; Vrielynck et al., 2010b; Zetsche et al., 2009). Specifically, Ehring et al. (2009a) made sure that their distraction condition demanded a similar amount of concentration and verbal activity as the rumination tasks, and Goldwin et al. (2013) made sure that periods of depressive rumination and trauma recall were counterbalanced across groups. In summary, it was felt that performance bias was adequately controlled for in the experimental studies reviewed.

Measurement bias refers to the systematic differences between groups in how outcomes are assessed in a study. Blinding of study subjects and outcome assessors typically protects against this. Although blinding of participants was not seen as relevant to the research in question, we were interested in assessing the subjectivity of the outcome measures, and any inter-rater methodology used. All studies used validated self-report outcome measures as their main study outcomes, with three studies measuring physiological arousal by more objective means (Ehring, et al. 2009a; Ehring et al., 2009b; Schaich et al., 2013). In terms of

inter-rater methodology, thought samples were rated for degree of concreteness in Goldwin et al. (2013) by three independent raters trained in Stöber's coding system. These raters were blind to condition and to the purpose and hypotheses of the study. Intraclass correlation coefficients were computed, and showed good reliability. Similarly, independent raters blind to condition were sought for manipulation checks in two of the studies, and intraclass correlation coefficients also computed (Schaich et al., 2013; Zetsche et al., 2009). It is possible that some of the studies could have done more to account for possible measurement bias, but on the whole, measurement bias was deemed adequately controlled for in the studies reviewed.

Attrition bias refers to the systematic differences between study groups in withdrawals from the study. Descriptions of withdrawals were assessed in the studies reviewed. Four of the studies made no reference to drop-outs, suggesting there were none in their studies (Ehring et al., 2009b; Goldwin et al., 2013; Santa Maria et al., 2012; Zetsche et al., 2009). The other four studies made reference to specific numbers of participants who had to be excluded from analyses due to poor compliance with the test instructions or adherence to study protocols (Ball & Brewin, 2012; Ehring al., 2009a; Schaich et al., 2013; Vrielynck et al., 2010b) However, only Vrielynck et al. (2010b) detailed from which experimental conditions their drop-outs were from and discussed the effect of drop outs on the study in their discussion. This was probably due to the fact that the number of dropouts in the other three studies did not significantly affect the study sample size. None of the studies conducted intention to treat analyses. In summary, attrition bias was seemingly only relevant to half the studies reviewed, and was considered to have been adequately addressed in the studies it was relevant for.

3.2.2. Quality of the cross-sectional and longitudinal studies

In terms of assessing selection bias in cross-sectional and longitudinal studies, we were interested in the methodology used to select cases for participation in the study. In both their cross-sectional and longitudinal studies, Ehring et al. (2008) assessed PTSD and depression amongst individuals who had experienced a road traffic accident using the Structured Clinical Interview for the DSM-IV (SCID; First, Spitzer, Gibbon, & Williams, 1996). In addition, in their longitudinal study, they

conducted the Acute Stress Disorder Scale (ASDS; Bryant, Moulds, & Guthrie, 2000) as an interview and rated the presence or absence of the DSM-IV criteria for Acute Stress Disorder. They report high inter-rater reliabilities for the SCID and ASDS interviews. Similarly, Birrer et al. (2007) and Michael et al. (2007) assessed PTSD in both their cross-sectional and longitudinal studies with a modified version of the Posttraumatic Diagnostic Scale (PDS; Foa, Cashman, Jaycox, & Perry, 1997), which is reported to show good agreement with the SCID. However, neither of these studies used a structured diagnostic interview, which may have meant that their samples exhibited other psychopathology that may have influenced their results. Indeed Birrer at al. (2007) comment that as they used a self-selected sample, it may have been the case that people with severe symptoms were either over or under represented in their study. However, on the whole, as these studies used robust, standardized measures to select their samples, selection bias was considered adequately controlled for. The one exception may be Bassanini et al. (2014) who selected a non-clinical 'convenience' sample 'from email contacts obtained through a previous study using an online data collection service'. There is little more detail on this sampling methodology, and it is therefore unclear whether the sample is representative of the non-clinical Italian population.

Both Birrer at al. (2007) and Michael et al. (2007) point to potential sources of measurement bias in their studies. Birrer at al. (2007) note that the Intrusion Questionnaire they used to measure intrusion qualities is not yet a validated measure, and thus they were unable to report on its psychometric properties. Michael et al. (2007) did not use a precise definition of "rumination", as they did not want to bias participant answers, but equally this could be seen as a source of imprecision. Indeed, Bassanini et al. (2014) wrote their paper in English, but presented one of their figures in Italian, so it is unclear to the English-speaking reader whether the particular conclusions the authors reach about these variables are justified by their results. Other the other hand, steps were taken by some studies to minimise measurement biases, with Ehring et al. (2008) using inter-rater reliability on a random proportion of the concreteness ratings from participants' rumination interviews, using raters who were blind to participants' diagnostic status. In summary, measurement bias was considered largely well

controlled for in the longitudinal and cross-sectional studies, with some studies acknowledging potential sources of bias somewhat better than others.

3.3. What can cross-sectional and longitudinal studies tell us about abstract and concrete processing in trauma-exposed individuals?

The results from longitudinal studies are based on a total number of 220 traumatised participants. The results from cross-sectional studies are based on a total number of 247 traumatised participants and 212 non-traumatised participants. Traumatised patients assessed in the cross-sectional and longitudinal studies were either individuals who had been injured in a road traffic accident as a driver, passenger, motorcyclist or cyclist whose injuries ranged from 'minor' to 'life-threatening' (Ehring et al., 2008), individuals who had experienced a physical or sexual assault (Michael et al., 2007), or patients with PTSD or with depression and a history of a traumatic experience (Birrer & Michael, 2011). Non-traumatised participants were individuals from the Italian general population who were asked about their typical responses to "unexpected, negative, everyday situations" (Bassanini et al., 2014).

In terms of what can be learnt about abstract and concrete processing from these populations, all studies confirmed the presence of abstract "*why*" and "*what-if*" type thoughts in relation to rumination about trauma, but few studies provided clear evidence of significant effects of this type of thinking on trauma-related outcomes.

With regards to the presence of abstract "*why*" and "*what-if*" type thoughts, Birrer and Michael (2011) found no difference in the frequency of these thoughts between groups of patients with PTSD, depression and a history of trauma, and depressed patients without trauma. They also found that rumination in all of these populations consisted of a mixture of "*why*" & "*what-if*" type thoughts (e.g. thoughts about how unfair the experience is, about what they could have done differently before the trauma/negative event happened, about what they could say or do to the perpetrator and thoughts about the trauma/negative event having destroyed their life), thoughts related to the stress event (e.g. thoughts about how they felt whilst they were experiencing the trauma/negative life event, about their

thoughts at the time, about the long term consequences of the trauma and thoughts about the worst part of the trauma) as well as depressive thoughts (thoughts about how bad they are, how threatening the world is, how incompetent they are, their wrong decisions, their bad relationships with others and thoughts about never being able to trust anybody anymore).

Bassanini et al. (2014) revealed that non-clinical individuals may have inherent preferences for "*why*" vs. "*how*" thinking in response to unexpected negative events. When the authors asked participants to justify their preference for "*why*" vs. "*how*" thinking, the group that typically adopted "*how*" responses cited reasons such as "it helps me not to think about painful things", "I can't stand wasting time on useless thoughts" and "it helps me to understand what to do actually". The "*why*" group cited more dysfunctional reasons, such as "it helps me to understand why I failed", and "this is who I am".

With regards to effects of abstract and concrete thinking on trauma-related outcomes, both Michael et al. (2007) and Ehring et al. (2008) found that rumination per se was significantly associated with PTSD severity at the time of interview and at 6 month follow-up in traumatised populations. In addition, Michael et al. (2007) found that occurrence of abstract "*why*" and "*what-if*" type questions (alongside other factors) explained a significant proportion of the variance in PTSD severity at interview and at 6 month follow-up. Bassanini et al. (2014) found that non-clinical individuals who typically use a "*why*" thinking style in response to negative unexpected situations were more likely to exhibit greater levels of depressed mood, even when controlling for depressed symptoms. These findings are important to note as they underlie theoretical assumptions and the link between rumination and trauma-related outcomes.

However, Ehring et al. (2008) found no relationship between the level of concreteness of participants' ruminations about their trauma and rumination or PTSD severity at the time of interview. Their longitudinal study provided some indirect support for the hypothesis that reduced concreteness is associated with the maintenance of PTSD following trauma (as rumination and reduced concreteness together predicted PTSD at 6 months better than rumination

frequency alone), and yet despite this, the authors note that the results are theoretically disappointing. As such, they ask for great caution to be taken in interpreting these results, and call for more research before firm conclusions regarding the role of reduced concreteness in trauma-related rumination are drawn.

Ehring et al. (2008) explain their lack of correlation between self-reported rumination and level of concreteness in the Rumination Interview by suggesting that their methodology differed from studies of worry where this link has previously been found (Stöber et al., 2000). They also argue that the anticipation of future events (as in worry) may lend itself to a greater range of levels of concreteness than thoughts about past experiences that have already happened (as in rumination), as these are by definition more concrete than future events. They call for a more fine-grained investigation into the concreteness vs. abstractness of thinking about trauma-related concerns.

3.4. What can cross-sectional and longitudinal studies say about the mechanisms by which abstract and concrete processing influence outcomes in trauma-exposed individuals?

Given the paucity of available evidence on how abstract and concrete processing may affect outcomes for trauma-exposed individuals, it is unsurprising that the cross-sectional and longitudinal papers say little with respect to hypothesised mechanisms about how these processing modes operate.

Birrer et al. (2011) talk to the theory of cognitive avoidance in relation to abstract "*why*" and "*what-if*" type thinking. They suggest that dwelling on negative issues related to the trauma and not thinking actively about the traumatic experience itself hinders emotional processing of trauma (Foa & Kozak, 1986).

In relation to abstract "*why*" thinking and its influence on depressive mood state, Bassanini et al. (2014) hypothesise that this processing style probably leads to an increase in negative mood since it does not permit the availability of concrete solutions. This hypothesis is supported by the results of their study as concrete "*how*" thinking allowed individuals to generate solutions to unexpected situations

and these participants were less depressed as a result. Caution should be taken before extrapolating the results of this study to trauma-exposed populations, as it is unclear whether all the "negative unexpected situations" on which the processing modes were trialled classified as analogue-traumas in the strictest sense. Therefore the preferences made for "*how*" vs. "*why*" processing in this study may better reflect the usual cognitive responses of individuals to everyday negative problems rather than trauma-related situations per se, although the negative consequences of "*why*" thinking are still of interest to note.

3.5. What can experimental studies tell us about abstract and concrete cognitive processing in analogue trauma-exposed individuals?

The results from experimental analogue studies are based on a total number of 580 non-traumatised participants, the majority of which were students. Some students were required to have particular characteristics akin to those found in a traumatised population. For example, Ball and Brewin (2012) pre-selected students who had a habitual tendency to ruminate, whereas Goldwin et al. (2013) used scores on rumination and posttraumatic stress disorder measures to compose experimental groups. Ehring et al. (2009), Santa Maria et al. (2012) and Vrielynck et al. (2010b) all required participants to have experienced an upsetting life event in the recent past and to still be showing some level of distress in relation to the event.

In terms of what can be learnt about abstract and concrete processing from these studies, there seems to be a mixed picture with regards to the precise maladaptive nature of abstract processing on trauma-related outcomes. The main trauma-related outcomes of typical interest across the studies were intrusive memories of the trauma (frequency, distress, vividness), negative mood and arousal.

Intrusive memories were measured in six of the studies included in the review (Ball & Brewin, 2012; Ehring et al., 2009a; Ehring et al., 2009b; Santa Maria et al., 2012; Schaich et al., 2013; Zetsche et al., 2009). The maladaptive nature of abstract thinking in relation to intrusive memories can be seen in Ball and Brewin (2012) whereby both abstract rumination about trauma film content and non-film content combined resulted in a higher total frequency of intrusions over seven days and a

greater number of days with intrusions when compared with a control group. In addition, Ehring et al. (2009a) found that abstract rumination in relation to a negative life event led to the maintenance in frequency and distress of intrusive memories in comparison to a distraction condition. In relation to concrete processing, the adaptive nature of concrete thinking is highlighted in Santa Maria et al. (2012) where the decrease in intrusive memories from 12hr to 36hr post writing about a negative life event was significantly larger in the group who wrote in a concrete-experiential way in comparison to the group who wrote in an abstract-evaluative way. The benefits of concrete processing can also be partially seen in Ehring et al. (2009b) where concrete thinking led to fewer intrusive memories of a trauma film than a distraction condition, although not significantly fewer than an abstract condition. Results from other studies were less supportive of the processing mode hypothesis in relation to intrusive memory outcomes. Schaich et al. (2013) failed to find a significant overall effect of processing mode condition on intrusive memories, although did find that concrete training moderated the effect of trait rumination on intrusive memories. Similarly, Zetsche et al. (2009) failed to find a significant effect of processing mode on intrusive memories, but did find an indirect effect, in that state rumination across all conditions was positively associated with the number of intrusive memories following the experimental manipulation.

Negative mood was also recorded in the same six studies (Ball & Brewin, 2012; Ehring et al., 2009a; Ehring et al., 2009b; Santa Maria et al., 2012; Schaich et al., 2013; Zetsche et al., 2009). In three of the studies, abstract rumination in relation to both trauma film stimuli and real life upsetting stimuli was found to lead to the maintenance of negative mood, in contrast to concrete rumination and distraction conditions where negative mood decreased (Ehring et al., 2009a; Ehring et al., 2009b; Zetsche et al. 2009). However, when Santa Maria et al. (2012) asked participants to write about their negative experiences in either an abstract or concrete mode, no differences in recovery from negative mood were found. Similarly when participants were trained in an abstract or concrete processing mode prior to watching a trauma film, no significant effect of training condition on negative mood was found (Schaich et al., 2013).

Physiological arousal was reported in three of the studies (Ehring et al., 2009a; Ehring et al., 2009b; Schaich et al., 2013) with abstract thinking leading to the maintenance of increased heart rate over concrete thinking in one study (Ehring et al., 2009b), but no significant effect of abstract rumination in comparison to distraction on arousal in another (Ehring et al., 2009a). Interestingly Schaich et al. (2013) found that a processing mode induction significantly moderated the relationship between trait rumination and heart rate, and between rumination and skin conductance at a trend level. Following abstract training, trait rumination was related to greater increase in arousal during the watching of a trauma film, whereas the opposite was true following concrete training.

Most of the studies adopted a "*why*" vs. "*how*" framework in relation to abstract and concrete processing, with the exception of two studies (Goldwin et al., 2013; Vrielynck et al., 2010b). Vrielynck et al. (2010b) were interested in *low* vs*. high* construal levels of thinking, and asked participants to write about a negative life event for several days, at either a *low-construal* level (i.e. in a concrete processing mode) or a *high-construal* level (i.e. in an abstract processing mode). They found that participants adopting a low-level construal were less distressed about the event during subsequent writing sessions than individuals who wrote at a high-construal level. Another unique study was Goldwin et al. (2013) who were interested in concreteness ratings of trauma recall narratives, which they rated using Stöber's concreteness coding system (Stöber & Borkovec, 2002). The authors found that concreteness of trauma recall did not differ between groups categorised by high rumination/high posttraumatic stress symptoms (PTSS), high trait rumination only, high PTSS only or controls. However, they did find that when participants were asked to report the percentage of thoughts and images they experienced in relation to both depressive rumination and trauma recall, trauma recall was characterised by greater image-based activity than depressive rumination, whereas depressive rumination was characterised by significantly higher verbal-linguistic activity. The authors concluded that this result demonstrates the uniqueness of trauma recall in comparison to other forms of repetitive negative thinking such as worry and depressive rumination.

3.6. What can experimental studies say about the mechanisms by which abstract and concrete processing modes influence outcome in trauma-exposed individuals?

Despite some mixed findings on trauma-related outcomes, overall there seems to be consistent support from the experimental literature that the processing mode hypothesis can be successfully applied to thinking about trauma. However, conclusions about the mechanisms by which abstract and concrete processes exert their effects have been tentatively drawn, as few studies have examined these mechanisms directly. The main theoretical explanation for the adaptive and maladaptive effects of concrete and abstract trauma-related thinking seems to be that abstract processing acts as a type of cognitive avoidance that hinders successful emotional processing of the trauma, whereas concrete processing enables it (Foa & Kozak, 1986). This is the same mechanism hypothesised to underlie the dysfunctional effects of worry in GAD (Borkovec, Shadick, & Hopkins, 1991). In relation to trauma, the theory proposes that "*why*" and "*what-if*" questions that characterise trauma-related rumination serve to "help" individuals avoid processing the worst moments of the trauma, as they distract from more distressing cognitions, such as visual memories of the event (Ehlers & Steil, 1995). Although some individuals may feel that this strategy is beneficial (as illustrated by Bassanini et al., 2014), cognitive models of PTSD suggest otherwise.

Ehlers and Clark (2000) propose that cognitive processing of the traumatic event in a way that induces a sense of current threat is key to the maintenance of persistent PTSD. They suggest that this sense of current threat typically results from two key processes: (1) excessive negative appraisals of the trauma and/or its sequelae; (2) disturbance in autobiographical memory of the event, which is poorly elaborated and contextualised. All of the discussion sections in the experimental studies reviewed hypothesise that abstract-evaluative thinking about the trauma and/or its sequelae serves to maintain PTSD symptoms (e.g. heightened arousal, negative alterations in mood, intrusive memories) by encouraging processes (1) and (2), whereas concrete-experiential thinking interrupts them both.

Specifically, abstract thinking consisting of "*why*" and "*what-if*" thoughts is hypothesised to reinforce and maintain negative appraisals about the trauma, which could include overgeneralising from the event and perceiving other activities as more dangerous than they really are (e.g. 'nowhere is safe'), exaggerating the probability of further catastrophic events happening to oneself (e.g. 'I attract disaster'), or construing negative appraisals of one's own feelings and behaviour during the event (e.g. 'It was all my fault'). The overlap between abstract negative appraisals of self, world and others in depression and trauma-related negative appraisals was shown in Birrer et al. (2011) where no difference was found in relation to the presence of "*why*" and "*what-if*" type thinking in both PTSD and depressed populations. The perpetuation of negative appraisals is also presumably the mechanism by which abstract rumination about trauma prevents recovery from negative mood (Ehring et al., 2009a; Ehring et al., 2009b; Zetsche et al. 2009).

On the other hand, concrete processing is hypothesised to facilitate functional appraisals of the trauma and/or its sequelae by providing specific contextual information that prevents the perpetuating cycle of negative overgeneralising from one distressing experience to another. This can be seen in Vrielynck et al. (2010b) where writing in a concrete way about the unique aspects of a stressful event helped participants to feel less distressed during re-confrontation with the event, better able to make sense of the event experienced and to express less anger when thinking about the event. This supports the idea that focusing on the actual situation itself in a concrete way facilitates more functional appraisals of the trauma and is therefore better than trying to think generically/abstractly about it. However, none of the studies in the present review examined the direct effect of processing mode on individual appraisals of the trauma, so at present this argument is only theoretically permissible and warrants specific research attention.

In terms of the process of elaborating and contextualising the autobiographical memory for the traumatic event, few studies directly reported on this, although most studies endorsed it as a proposed mechanism by which processing modes exhibit their effects. The hypothesis is that concrete processing enables the

elaboration of the trauma memories, and in doing so, increases associations with other stored autobiographical information. In this way, concrete processing may theoretically have the effect of integrating the trauma memory into an individual's autobiographical memory base, facilitating intentional retrieval of trauma-related material, increasing the coherence of the memories, and rendering the memories less vulnerable to triggering by matching sensory cues in the environment (i.e. fewer intrusive memories). When this processing is disrupted (e.g. in the form of abstract processing), trauma memories may be poorly integrated into autobiographical memories, which would theoretically result in more disorganised trauma memories, poorer intentional recall and increased likelihood in involuntary trauma-related intrusions.

To test this, Zetsche et al. (2009) employed a specific concrete processing condition as part of their processing mode manipulation called "memory integration". This condition aimed to integrate the traumatic experience of watching a trauma video into preceding and subsequent experiences in autobiographical memory (See Table 3 for details). The authors hypothesised that participants in this condition would experience fewer intrusive memories than participants in abstract ruminative processing or control processing modes in line with the above theory. However, this hypothesis was not supported. The authors suggested that their methodology may have been partly at fault, in that just asking participants to think about concrete questions may not have been enough to help memory elaboration and integration processing, as well as the fact that some memory integration questions may have directly induced rumination rather than functional processing in rumination-prone individuals. They did find however some encouraging correlational evidence that intrusive memories were negatively correlated with levels of memory integration adjusted for rumination, which is supportive of Ehlers and Clark's (2000) proposal that memory integration is needed for successful recovery from PTSD.

As Ehring et al. (2009b) found no difference between abstract and concrete processing conditions on the subsequent frequency of intrusive memories, but did find a difference on mood and arousal measures, they proposed a slight variation to the emotional processing hypothesis. They suggest that abstract processing may

exert its negative effects via mood/arousal and therefore impede upon emotional processing via the strengthening of negative appraisals of the trauma, rather than via the prevention of the elaboration of the trauma memory.

In summary, there are promising experimental findings providing support for the idea that the distinction between abstract and concrete processing can account for the functional and dysfunctional effects of repetitive thinking about traumatic/highly distressing experiences. The literature reviewed seems to be in agreement about the mechanisms linked to emotional processing through which these processing modes are operating in trauma-exposed populations. The proposal that abstract "*why*" and "*what-if*" processing is a cognitive avoidance that serves to hinder emotional processing of the trauma is made reference to in the majority of the papers reviewed with particular reference to Ehlers and Clark's (2000) cognitive model of PTSD. However, as of yet, there has been little research directly examining the effects of processing mode on the key components of Ehlers and Clark's (2000) cognitive model, i.e. appraisals of the trauma and autobiographical memory of the event. Therefore the emotional processing mechanism in relation to the processing mode hypothesis is at present only theoretically supported. Figures 3 and 4 summarise the proposed theoretical mechanisms by which abstract and concrete processing styles seemingly affect outcomes in trauma-exposed individuals.

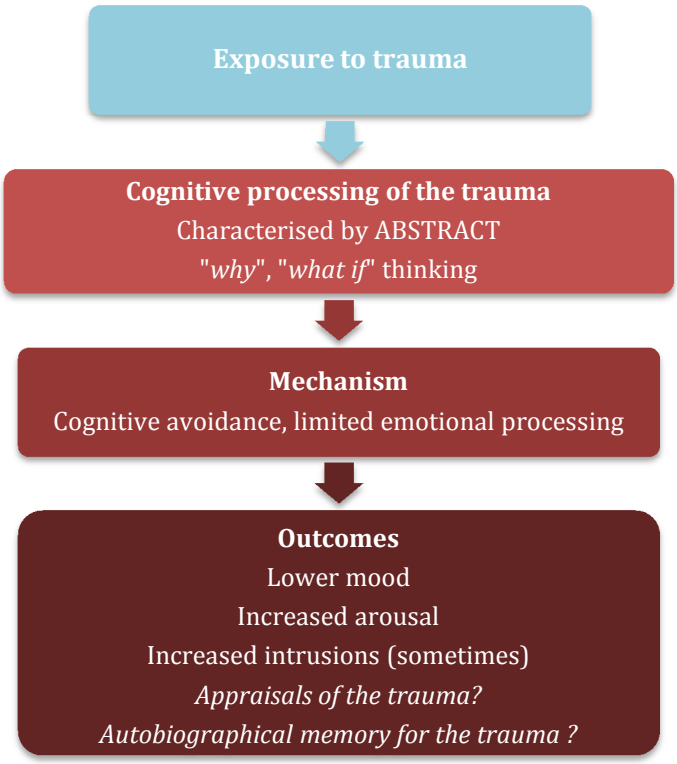

Figure 3. A summary diagram to show the proposed theoretical mechanism by which an abstract processing style affects outcome in trauma-exposed individuals

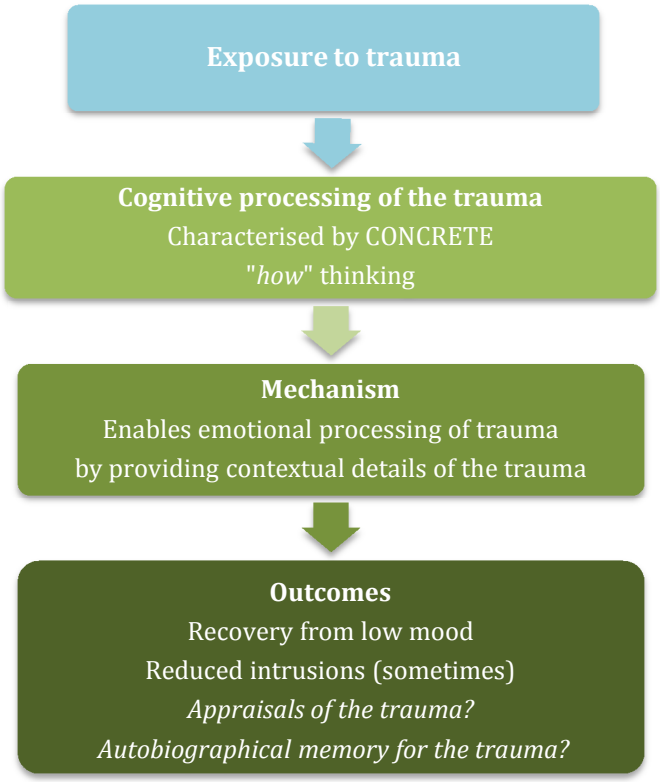

Figure 4. A summary diagram to show the proposed theoretical mechanism by which a concrete processing style affects outcome in trauma-exposed individuals

4. DISCUSSION

4.1. Summary of the evidence

The present systematic review aimed to summarise the extant literature with regards to the effects of "abstract" and "concrete" cognitive processing styles on outcomes in trauma-exposed individuals. In addition, the review aimed to provide clarity on the mechanisms by which these processing styles may be operating. We identified a total of 14 published studies on the topic, all of which had been published in the last 8 years.

In line with Ehring et al.'s (2011) prediction about the types of studies in this research area, the studies we identified as reporting on abstract and concrete processing modes in relation to trauma were either cross-sectional or longitudinal studies conducted with traumatized samples, or experimental studies conducted with healthy non-traumatized participants. We found one exception to this: a cross-sectional study of a non-clinical population that was interested in "*why*" and "*how*" thinking in response to stressful events in the general population (Bassanini et al., 2014). All of the studies reviewed were considered to have adequately controlled for selection bias, performance bias, measurement bias and attrition bias where appropriate.

Cross-sectional and longitudinal studies illustrated the presence of abstract "*why*" and "*what-if*" type thinking in traumatised populations, as well as highlighting individual preferences for abstract or concrete processing in relation to stressful events amongst the general population. In terms of dysfunctional effects of abstract processing, "*why*" and "*what-if*" thinking was found to explain a significant proportion of the variance in PTSD severity in the days, weeks and months after a traumatic event. However, there was no clear evidence that reduced concreteness of trauma-related ruminations were responsible for rumination amount or PTSD severity. Possible mechanisms by which abstract processing exerts a negative effect are alluded to in a few of the papers, such as the mechanism of cognitive avoidance that hinders emotional processing and prevents the generation of solutions to problematic stressful events.

Experimental studies tended to manipulate processing modes in student populations, using a trauma-film or own distressing life-events as analogue traumatic stressors. The main outcomes of interest in these studies were intrusive memories of the trauma, negative mood and arousal. The findings are mixed with regards to each of these outcomes, caveated by study methodology, but on the whole, the picture is emerging that abstract processing results in the maintenance of intrusive memories about the trauma, negative mood and increased arousal, whereas concrete processing facilitates recovery from these. The majority of experimental studies allude to the hypothesis that abstract processing is dysfunctional because it hinders successful emotional processing of the trauma (Foa & Kozak, 1986). However, only one study directly tested this mechanism by including a concrete mode manipulation specifically designed to promote autobiographical memory integration in relation to the emotional processing hypothesis (Zetsche et al., 2009). However, this study only found correlational evidence that intrusive memories are negatively correlated with levels of memory integration adjusted for rumination.

4.2. Limitations

A number of limitations to the present review are noteworthy. First, due to the narrative nature of the review and the range in the type of studies reviewed, an established quality assessment tool was not employed to assess the potential bias in the studies reviewed. Instead the quality of the studies was reviewed narratively by the author, which could be considered as a less accurate assessment of the methodological rigour of the reviewed studies. Second, in terms of potential bias within the included studies, it is worth highlighting that eight of the included studies were co-authored by the same author. Although this is probably a reflection of a keen research interest, it is important for other research groups to also investigate this topic so that we can have increased confidence that these processes operate in the way hypothesised across a variety of trauma-exposed populations. Third, although the search strategy was limited to articles published in peer-reviewed journals, it may be the case that grey-literature or publications in-preparation/in-press exist on this topic. The results of this review should be interpreted in light of the fact that it was written at a point where published studies are just beginning to emerge in this area, and as such, it may be the case

that the number of published studies regarding processing mode in relation to trauma will increase in the future and provide stronger answers to the questions posed in this review.

4.3. Future research directions

Given the accumulating evidence that processing style is partly responsible for adaptive vs. maladaptive outcomes in trauma-exposed individuals, it seems an important next step, as highlighted by Santa Maria et al. (2012), for research in this area to now explore the exact mechanisms by which abstract and concrete processing styles exert their effects. At the moment there seems to be a strong theoretical rationale for abstract "*why*" and "*what-if*" processing to be a form of cognitive avoidance that hinders emotional processing of the trauma, and therefore inhibits successful elaboration and integration into autobiographical memory. However, as of yet, there is little empirical support for this precise hypothesis. Experimental studies manipulating processing mode should measure the effect of abstract vs. concrete thinking about trauma on memory for the trauma, as well as appraisals of the trauma, preferably weeks after exposure to the traumatic stimuli. Attempts should also be made to directly test whether the other mechanisms by which abstract and concrete processes have been proposed to operate in repetitive thinking in depression and worry (see Section 1.2) also apply to trauma-related rumination.

There may also be potential moderators of the effect of processing mode on trauma-related outcomes and future studies should seek to clarify these. For example, one reason for the discrepancy in significant and non-significant effects of processing mode manipulations on trauma-related outcomes may be that an effect of processing style is moderated by the degree to which the events are personally relevant to participants. This can be seen in the present review where more studies focusing on intrusions about real-life events (Ehring et al., 2009a; Santa Maria et al., 2012) tended to produce significant effects of processing style than studies that focused on intrusive memories about a stressful film (Ehring et al., 2009b; Zetsche et al., 2009). It may also be the case that results from trauma film studies where participants were instructed to watch a trauma might be a truer reflection of the cognitive processes in witnesses of traumatic situations, rather

than of those directly involved. Future studies should investigate the potential effect of personal relevance further, and may wish to consider using virtual reality technology as a way of manipulating personal relevance of traumatic stimuli. Additional moderators alluded to in the present studies might be trait rumination, as this has been found to be the case in the depression literature (Moberly & Watkins, 2006; Watkins, 2004), and gender, as found by Zetsche et al. (2009). Future studies should examine the role of these and other moderating factors.

Moreover, even within abstract and concrete processing there are different dimensions to consider. There is some emerging evidence from the studies reviewed that *low* vs. *high* level construals produce the same picture of results as evaluative vs. non-evaluative thinking (Vrielynck, Francois & Philippot, 2010a), but the effects of evaluative vs. non-evaluative thinking remain unexplored. Future research should investigate this issue more closely by manipulating various dimensions of abstract and concrete thinking independently.

5. CONCLUSIONS

The present review aimed to synthesise the extant literature on the role of cognitive processing styles in relation to thinking about trauma, and in doing so has gathered support for the hypothesis that an abstract processing style is maladaptive and a concrete mode is adaptive when in comes to outcomes in trauma-exposed individuals (e.g. intrusions, negative mood and arousal). Although not all studies found evidence to support this hypothesis, we would argue that "absence of evidence is not evidence of absence" (Altman & Bland, 1995), as this is an emerging research area and researchers are still attempting to refine their methodology when it comes to measuring or manipulating processing mode or intrusive memories. The majority of studies in this area seems to be in agreement about the theory behind maladaptive abstract processing, and look to both Foa and Kozak (1986)'s theory of emotional processing of fear-related stimuli and Ehlers and Clark's (2000) cognitive theory of persistent PTSD to provide an answer. It seems theoretically plausible that abstract "*why*" and "*what-if*" processing of trauma is a cognitive avoidance strategy, which hinders the emotional processing of trauma, and thus perpetuates traumatic symptoms. What is now needed is

empirical evidence to support the idea that emotional processing has been hindered by abstract processing, which would require examination of trauma related appraisals and trauma memory integration in future studies. If the theory is further supported in this way, the research can confidently move in a clinical direction with the designing and testing of treatments for trauma-exposed individuals that encourage concrete processing of traumatic events.

Table 1. Summary of experimental papers

Author (year)	Country	Total n	Female (%)	Population	Method Conditions (n)	Primary outcome(s) (measure)	Main effects of condition on outcomes	Conclusions about abstract/concrete processing mechanisms cited in the studies
Ball *et al*. (2012)	UK	60 (57 at end)	70	University students categorised as moderate-high ruminators	Trauma film exposure followed by allocation stratified by gender to either: 1. Film-related rumination (n=20) 2. Non-film related rumination (n=20) 3. No task control (n=20) Rumination conditions practiced rumination daily for 1 week	Intrusive memories (frequency, no. of days experienced, distress, reliving, vividness) Mood (DASS-21)	**Intrusion measures:** Rumination conditions (combined) ↑ control (frequency, no. of days experienced) **Mood measures:** Rumination conditions combined ↔ control	**Abstract processing…** 1. may divert attention from trauma & prevent elaboration/contextualisation of trauma memory 2. may strengthen negative appraisals of trauma & prevent updating of memories 3. may directly trigger intrusions/negative mood which may trigger more PTSD symptoms & further ruminative attempts to problem solve & manage distress
Ehring, Szeimies, Shaffrick (2009b)	Netherlands	83	67.5	Healthy university students	Trauma film exposure followed by random allocation stratified by gender to either: 1. Abstract-ruminative thinking (n=28) 2. Concrete thinking (n=28) 3. Distraction (n=27) All conditions exposed to film reminders. FU after 3 days	Intrusive memories (frequency, vividness, distress) Mood (+/-) (PANAS) Arousal (heart rate)	**Intrusion measures:** Concrete ↓ distraction (frequency) Abstract ↔ concrete Abstract ↔ distraction **Mood measures:** Abstract ↑ concrete (-ve mood) Abstract ↑ distraction (-ve mood) **Arousal measure:** Abstract ↑ concrete Abstract ↑ distraction	**Abstract processing…** 1. may have different effects on different types of symptoms, e.g. mainly effecting emotional processing of the trauma via mood/arousal rather than via intrusions, and therefore strengthened negative, overgeneral, catastrophising, dysfunctional appraisals of the trauma, rather than preventing the elaboration of the trauma memory.

Author (year)	Country	Total n	Female (%)	Population	Method Conditions (n)	Primary outcome(s) (measure)	Main effects of condition on outcomes	Conclusions about abstract/concrete processing mechanisms cited in the studies
Ehring, Fuchs, Kläsener (2009a)	Netherlands	51	72.5	Students who had experienced a negative event within the past 2 years and still felt distressed	Participants were asked to provide a detailed narrative of the event, then randomly assigned to either: 1. Rumination condition (n=29) 2. Distraction (n=22) Both conditions exposed to a symptom provocation task	Intrusive memories (frequency, distress) Mood (+/-) (PANAS) Arousal (heart rate)	**Intrusion measures:** Rumination ↑ distraction (frequency, distress) **Mood measures:** Rumination ↑ distraction (-ve mood) **Arousal measure:** Rumination ↔ distraction	**Abstract processing…** 1. May interfere with emotional processing, but unclear whether effects are due to distraction or ruminative style of thinking 2. May be a cognitive avoidance strategy employed by individuals who wish to escape from aversive imagery and negative emotions
Goldwin *et al.* (2013)	USA	111	76.4	Psychology students pre-selected based on rumination and post traumatic stress disorder symptoms	Participants grouped into: 1. High trait rumination/high posttraumatic stress symptoms (PTSS) (n=23) 2. High trait rumination only (n=13) 3. High PTSS only (n=25) 4. Controls (n=50) Completed 3 rumination conditions: 1. Baseline rumination 2.Depressive rumination 3. Trauma recall	Rumination content ratings (percentages of thoughts and images) Rumination concreteness (Stöber scale)	**Rumination content:** Trauma recall ↑ depressive rumination or baseline (percentages of images). Depressive rumination ↑ trauma recall or baseline (percentages of thoughts). **Rumination concreteness:** ↔ Across all groups during baseline or trauma recall High rumination/high PTSS group ↓ high rumination group during depressive rumination	**Abstract processing…** 1. In relation to trauma recall seems to be distinct from abstract thinking in worry/depressive rumination as it is associated with greater levels of imagery-based activity rather than verbal-based activity, which is theoretically associated with enhanced emotional processing

Author (year)	Country	Total n	Female (%)	Population	Method Conditions (n)	Primary outcome(s) (measure)	Main effects of condition on outcomes	Conclusions about abstract/concrete processing mechanisms cited in the studies
Vrielynck *et al.* (2010b)	Belgium	54	85.2	Healthy participants who had experienced one or several upsetting life events in the last 5 years that they hadn't recovered from and hadn't talked about	Participants were asked to either: 1. Write about their experience at a low-construal level (concrete) (n=19) 2. Write about their experience at a high-construal level (abstract) (n=20) 3. Write about a neutral topic (control) (n=15) All instructed to write for 3 consecutive days for 20 mins a day	Distress (GHQ) Anger (in, out; SAES) Search for meaning (7-point Likert-scale)	**Distress measure:** Low-level ↓ high-level over time **Anger measure:** High-level ↑ low-level (anger-in) Control ↑ high-level (anger-out) Control ↑ low-level (anger-out) **Need to search for meaning measure**: Low-level ↓ high-level Low-level ↔ control High-level ↔ control	**Low-level construals…** 1. May have facilitated the organisation and integration of the stressful event in the autobiographical memory database, or in pre-existent cognitive schemas 2. May have encouraged a more concrete processing of emotional information, which resulted in decrease in maladaptive rumination, i.e. less need to search for meaning in relation to the event. This suggests that a deep cognitive processing of emotional information during disclosure is necessary for emotional processing to occur
Zetsche *et al.* (2009)	UK	101	70.3	Healthy participants	Trauma film exposure, followed by random allocation stratified by gender to either: 1. Abstract rumination about the film (n=32) 2. Concrete "memory integration" (n=35) 3. Distraction (n=34) FU after 1 week	Intrusive memories (frequency of spontaneous & triggered) Mood (sad, fearful) (PANAS-X) State rumination (PTQ-S)	**Intrusion measures:** Abstract ↔ concrete Abstract ↔ distraction Concrete ↔ distraction **Mood measures:** Abstract ↑ concrete (sad mood) Abstract ↑ distraction (sad mood) **State rumination:** Correlated sig. with number of intrusive memories across all conditions	**Concrete processing…** 1. May promote the integration of trauma experiences with other autobiographical memories, and therefore inhibit the cue-driven retrieval of intrusive memories. However, there was only partial/indirect support for this theory **Abstract processing…** 1. In trauma-related rumination may work similarly to depressive rumination by exacerbating negative affect (sad mood). It may prolong recovery from PTSD by strengthening negative appraisals of the trauma

Author (year)	Country	Total n	Female (%)	Population	Method Conditions (n)	Primary outcome(s) (measure)	Main effects of condition on outcomes	Conclusions about abstract/concrete processing mechanisms cited in the studies
Santa Maria *et al.* (2012)	Netherlands	57 (55 at FU)	66.7	Healthy university students who had experienced a negative life event within the past 5 years	Participants engaged in a symptom provocation task, followed by random allocation stratified by gender to either: 1. Abstract-evaluative (n=29) writing condition 2. Concrete-experiential (n=28) writing condition FU after 12h & 36h	Intrusive memories (frequency, vividness, type, distress) Mood (-) (PANAS)	**Intrusion measures:** Concrete ↓ abstract from 12h to 36h at FU (frequency) **Mood measure:** Abstract ↔ concrete	**Abstract processing…** 1. May maintain PTSS, by reinforcing and maintaining existing negative appraisals and interfering with emotional processing and problem solving **Concrete processing…** 1. Does not inhibit functional processing and allows for recovery from PTSS by elaborating and contextualising the event memory and modifying excessively negative event-related appraisals
Schaich *et al.* (2013)	Netherlands	68	100	Healthy female students	Participants were trained in either: 1. Abstract processing (n=32) 2. Concrete processing (n=34) Then exposed to a trauma film, followed by a symptom provocation task. FU after 1 week	Intrusive memories (frequency, vividness, distress) Mood (-) (PANAS) Arousal (heart rate, skin conductance) Trait rumination (RRS/RSQ)	**Intrusion measures:** Abstract ↔ concrete (frequency, vividness, distress) **Mood measure:** Abstract ↔ concrete (-ve mood) **Arousal measures:** Abstract ↔ concrete (heart rate, skin conductance) **Trait rumination:** Related to intrusive memories in abstract condition only	**Abstract processing…** 1. May interfere with the elaboration and contextualisation of the trauma memory and the modification of negative appraisals as it reinforces global trauma-related appraisals **Concrete processing…** 1. Is more likely than abstract processing to expose the individual to specific details of the traumatic memory which would facilitate the elaboration and contextualisation of the trauma memory 2. Should lead individuals to take in disconfirming evidence that is needed to modify dysfunctional appraisals

Key: ↓ =significantly lower scores than, i.e. more improvement, ↑ =significantly higher scores than, i.e. less improvement, ↔ =no significant difference between groups; (DASS-21)= Depression, Anxiety & Stress Scale; (PANAS)=Positive and Negative Affect Schedule; (PANAS-X)=Positive and Negative Affect Schedule-Expanded Form; (RRS/RIQ)=Ruminative Response Scale of the Response Style Questionnaire; (GHQ)=General Health Questionnaire; (SAES)=Speilberger Anger Expression Scales; (PTQ-S)=Perseverative Thinking Questionnaire – State Version

Table 2. Summary of cross-sectional/longitudinal studies

Author (year)	Country	Total n	Female (%)	Population	Method	Primary outcome(s) (measure)	Main findings	Conclusions about abstract/concrete processing mechanisms cited in the studies
Bassanini *et al.** (2014)	Italy	212	76.9	Italian general population	Participants completed online questionnaires about their usual cognitive responses (abstract "why" vs. concrete "how" thinking), propensity to ruminate, and mood) in response to negative everyday unexpected situations*	Repetitive thinking style (Processing mode structured-questionnaire) Depression (BDI) Propensity to ruminate (RRS/RSQ)	**Rumination thinking style measures:** A higher "why" tendency of ruminative thought predicts lower final mood state, even when controlling for depressive symptoms	**Abstract processing…** 1. May lead to an increase in negative mood as it does not permit the availability of actual concrete solutions 2. May persist in some individuals because of "cognitive fusion". Individuals who are cognitively fused to dysfunctional beliefs tend to prefer "why" styles of thinking as they believe "why" thinking reflects "who they are"
Birrer *et al.* (2011)	Switzerland	65	89.2	Patients either had: 1. PTSD 2. Major depression with past traumatic experience 3. Major depression with no history of trauma	Participants completed questionnaires about rumination (including questions about "why" and "what-if" abstract content) and kept a rumination log for 1 week	Data on rumination (if it occurs, how long, time of day, emotions, content, level of intrusiveness)	**Rumination measures:** ↔ Across all groups on presence of "why" and "what-if" type thoughts, thoughts related to the stress event or depressive thoughts PTSD groups ruminated ↑ than depressed w/out trauma group	**Abstract processing…** 1. Is one of many modes of rumination. Ruminative thoughts can also be depressive, or related the stressful event 2. In relation to trauma may provoke avoidance that in turn exacerbates depressive thoughts

Author (year)	Country	Total n	Female (%)	Population	Method	Primary outcome(s) (measure)	Main findings	Conclusions about abstract/concrete processing mechanisms cited in the studies
Ehring *et al.* (2008)	UK	101 (Cross-sectional study) 147 (Longitudinal study)	44 33	Road traffic accident survivors Interviewed 3-12 months post-accident (cross-sectional) or Interviewed on day/within a week of the accident (longitudinal)	Participants completed self-report questionnaires about their propensity to ruminate, a rumination interview and PTSD/depression symptom measures. Longitudinal participants FU for 6 months	Propensity to ruminate about trauma (RS/RIQ) Propensity to ruminate about depression (RRS/RSQ) Rumination concreteness (Stöber scale) PTSD symptom severity (PDS) Depression (BDI)	**Rumination measures:** Rumination about trauma sig. correlated with PTSD severity, and significantly predicted PTSD at 6 months Reduced concreteness was not correlated with rumination frequency or PTSD severity However, reduced concreteness and rumination frequency together predicted subsequent PTSD better than rumination frequency alone	**Abstract processing…** 1. May vary in concreteness depending on whether the person is worrying about a future event or ruminating about a past event. Rumination about future events (worry) may lend itself to a greater range of levels of concreteness than thoughts about past experiences that have already happened (rumination), as the latter are more concrete by definition
Michael *et al.* (2007)	UK	81 (Cross-sectional study) 73 (Longitudinal study)	40.7 45.2	Individuals who had experienced a physical or sexual assault	Participants completed self-report questionnaires of PTSD symptoms and associated symptoms, a general information questionnaire/interview, and a rumination interview. Longitudinal participants were FU at 6 months	PTSD symptom severity (PDS) Data on rumination (presence, compulsivity, occurrence of "why" & " what-if" questions, occurrence of unproductive thoughts, negative feelings before & after rumination)	**Rumination measures:** The presence of rumination was significantly associated with PTSD severity Occurrence of "why" & " what-if" questions (and other factors) predicted PTSD severity at time of interview and 6 months later	**Abstract processing…** 1. May be maladaptive because it constitutes a form of cognitive avoidance, thereby hindering emotional processing of the trauma

Key: ↓ = significantly lower scores than... i.e. more improvement, ↑ = significantly higher scores than… i.e. less improvement, ↔ = no significant difference between groups; (BDI) = Beck Depression Inventory; (RS/RIQ) = Rumination scale of the Responses to Intrusions Questionnaire; (RRS/RSQ) = Ruminative Response Scale of the Response Style Questionnaire; (PDS) = Posttraumatic Diagnostic Scale

Table 3. Summary of analogue trauma stressors and abstract/concrete manipulations and measurements

Article	Analogue trauma stressor	Examples of abstract or concrete processing mode instructions given to participants OR examples of abstract/concrete rumination measurements
Ball *et al*. (2012)	Trauma film of 5 separate real-life RTAs, lasting 12.5 minutes. Includes dead bodies, body parts, close-ups of injuries, cries of pain and distress	After the film, participants were presented with six prompt questions depending on their condition and instructed to dwell on them, e.g.: "*Why are there so many reckless & careless drivers causing accidents like that?"* **(Abstract; film-related rumination)** *"Why didn't people do something before, to stop the financial crisis happening & affecting so many people?"* **(Abstract; non-film-related rumination)**
Ehring Szeimies, Shaffrick (2009b)	Trauma film of 8 separate real-life RTAs, lasting 17 minutes. Includes dead bodies, injuries people & emergency personnel at work.	After the film, participants read a transcript of a trauma survivor thinking about his trauma in an abstract/concrete way, were then presented with abstract ruminative/concrete thoughts and were instructed to dwell on them, e.g.: "*Why do so many accidents have to happen?"/"Why does road traffic have to be so dangerous?"/"What if such an accident happened to me?"* **(Abstract ruminative thinking)** "*Which different factors contribute to road traffic being so dangerous?"/"What exactly would I think and feel if such an accident happened to me?"* **(Concrete thinking)**
Ehring Fuchs, Kläsener (2009a)	Participants were asked to describe (out loud) a distressing but non-traumatic life event they had experienced within the past 2 years and were still distressed about	Participants had to rate how often particular abstract thoughts come to them in relation to their chosen negative event, and were instructed to dwell on them, e.g.: "*Why did this event happen to me?"/"What if I had behaved in a different way?"/"Why am I feeling so sad when I think about this event?"* **(Abstract thoughts about negative experiences)**
Goldwin *et al.* (2013)	Participants were asked to recall (in their mind) a past traumatic experience that they still think about frequently	Participants were interrupted at various points during their trauma-related rumination and were asked to record the contents of their thoughts at these points. The thoughts were rated for degree of concreteness using Stöber's coding system **(1 = abstract, 3 = neither abstract nor concrete, 5 = concrete)**

Article	Analogue trauma stressor	Examples of abstract or concrete processing mode instructions given to participants OR examples of abstract/concrete rumination measurements
Santa Maria *et al.* (2012)	Participants were asked to recall (in their mind) the "hot-spot" of their distressing life event and imagine it vividly	Participants were instructed to write about their experience in an abstract-experiential way or a concrete-experiential way, after being presented with relevant prompt questions, e.g.: *"Why do I feel the way I do when thinking about the event?"/"Why did it happen?"/"Why didn't I behave differently?"/"Which consequences will the event have for me in the future?"* **(Abstract-evaluative)** *"How do I feel at the moment?"/"How do I feel during the event?"/"What did I see, hear, think and do during the event?"/"What exactly can I do to deal with such a situation differently in the future?"* **(Concrete-experiential)**
Schaich *et al.* (2013)	Trauma film was a scene from a motion picture ("Irreversible", rated 16+) showing the raping and beating of a woman, lasting 14 minutes	Before the film, participants were presented with 15 positive and 15 negative scenarios and were instructed to process them in either an abstract or concrete way, e.g.: *"Please concentrate on this event for the following minute. Think about why it happened and analyse the causes, meanings, and implications of this event."* **(Abstract processing)** *"Please concentrate on this event for the following minute. Think about how it happened and imagine it in your mind as vividly and as concretely as possible, like a 'movie' about how this event unfolded."* **(Concrete processing)**
Vrielynck *et al.* (2010b)	Participants asked to identify an upsetting life event they had experienced in the past 5 years, that they had not recovered from and some of the features of which had not been disclosed previously	Participants were instructed to write about their life event at a low-construal level (concrete) or a high-construal level (abstract) or about a neutral topic, e.g.: *"Could you describe chronologically the different steps of the event?"/"How were objects exactly arranged around you in this place?"/"Who was present during the event?" "Could you describe their clothes, attitudes etc.?"* **(Low-level construal/concrete processing)** *"What place typically evokes that type of emotion associated with the upsetting event?"/"What characteristics in people remind you of the event?"/"What thoughts do you repetitively have in mind related to the upsetting event?"* **(High-level construal/abstract processing)**
Zetsche *et al.* (2009)	Same trauma film as used by Ehring et al. 2009, but updated to replace old German footage with more recent UK footage	After the film, participants were instructed to dwell on particular sentences depending on their condition, e.g.: *"Why do people have to drive that recklessly?"/"Would I ever be able to be the same person as before?"/"How can I drive again without thinking about what could happen?"* **(Abstract rumination condition)** *"Think about what you have done and how you felt before coming to the session"/"Has the experiment matched your expectations?"/"Think back to the video, judge which scenes you found most unpleasant and think about why and how the scenes were similar or different to your own experiences"/"Think about your own experiences on the road, especially those you find enjoyable and in which you feel safe"/"Think about your plans for the rest of the day"* **(Memory integration condition)**

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MAIN EMPIRICAL PROJECT

An experimental trauma film study to investigate the role of peri-traumatic cognitive processing on post-event PTSD symptoms and trauma memory

Primary supervisor: Dr Jennifer Wild

Secondary supervisor: Dr Patrick Smith

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ABSTRACT

BACKGROUND AND OBJECTIVES: Groups at risk of developing PTSD, such as emergency service workers, often know beforehand that they will be exposed to trauma. They therefore have the opportunity to adopt potentially protective peri-traumatic cognitive strategies. The broader literature has established that abstract cognitive processing of stressful events is more harmful than concrete cognitive processing. The present study tested the hypothesis that training to adopt concrete processing during analogue trauma would lead to fewer intrusive memories, PTSD symptoms, and better recognition and recall memory compared with training in abstract processing at one week follow up. The effects of natural processing on these symptoms, as well as the content of natural processing were also explored.

METHODS: Seventy-three healthy participants were trained to process traumatic films in an abstract mode (n=26) or concrete mode (n=26) or received no training ("natural" processing control) (n=21). Number and type of intrusive memories, PTSD symptoms, recognition memory and coherency of trauma recall were assessed after one week.

RESULTS: Training in concrete processing led to significantly fewer thought-based intrusive memories, PTSD symptoms, better recognition memory and a more coherent trauma recall narrative than training in abstract processing. No differences were found in the number of image and affect-based intrusive memories experienced between groups. Natural processing was identified in this sample to be a mixture of abstract and concrete processing. Significant differences between concrete and natural processing emerged in relation to PTSD symptoms and recognition memory. There were no differences between abstract and natural processing.

CONCLUSIONS: The study provides preliminary evidence that training to adopt concrete processing during analogue trauma may prove protective against the development of PTSD symptoms. The results need to be replicated in a prospective study of individuals at-risk of PTSD and likely to be exposed to trauma, such as newly recruited emergency service workers.

1. INTRODUCTION

1.1. Peri-traumatic factors are key to early intervention in PTSD

Since persistent PTSD is well known for its debilitating psychological and social consequences, it is imperative to focus research attention on early interventions aimed at reducing vulnerability to developing PTSD. This is especially pertinent for individuals who are exposed to trauma on a regular basis, as their risk of developing the condition is likely to be high. For example, increased rates of PTSD have been found amongst certain occupational groups who are regularly exposed to trauma, such as emergency personnel (Jonsson, Segesten, & Mattsson, 2003; van der Ploeg & Kleber, 2003) and the military (Hoge et al., 2004; Iversen et al., 2008). Indeed a recent systematic review (Skogstad et al., 2013) concluded that "professional first responders" to traumatic events, such as police officers, firefighters and ambulance personnel are more likely to suffer from PTSD than other professional groups. Thus far, numerous studies have indicated a range of pre-, peri- and post-traumatic factors associated with increased risk of PTSD. Two key meta-analyses have concluded that peri-traumatic processes, defined as "characteristics of the event itself, and cognitive and affective processes operating at the time", may be the best predictors of future PTSD symptoms (Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003). As a result, peri-traumatic factors have been given specific research attention in recent years.

1.2. Processing mode theory

One particular peri-traumatic process of interest is the mode of cognitive processing adopted during the traumatic event. The broader literature on emotional disorders has found consistent evidence that the mode or style of cognitive processing in which people think about negative events is an important factor in determining disorder-related outcomes.

This theory emerged from studies showing that rumination and worry are implicated in the onset and maintenance of a range of psychological disorders, including PTSD. Both rumination and worry are types of repetitive thinking, and Watkins (2008) hypothesised that such repetitive thinking can be functional or dysfunctional partly depending on the style or mode of cognitive processing that is

adopted. He observed that dysfunctional repetitive thinking tends to be characterised by higher-level, *abstract*, analytical, evaluative, general and de-contextualised processing. Such thoughts tend to consist of evaluative questions ("*Why did this happen?"*) that are focused on the discrepancies between current and unwanted outcomes ("*Why didn't anyone*…?", "*If only someone had*…"). By thinking in this way, a person's attention is directed to the negative causes, meanings and implications of the distressing issue. Conversely, more functional thinking tends to be characterised by lower-level, *concrete,* experiential, non-evaluative, specific and contextualised processing. These thoughts tend to consist of non-evaluative questions that refer to the direct experience and outcome ("*How did I feel at the time?", "What did I see/hear?").* By thinking in this way, a person is able to process their emotions in relation to the event, whilst focusing on the actual experience of the event. This allows for the creation of concrete mental representations of the contextual, specific and incidental details of the event.

Support for this hypothesis in relation to depression comes from experimental studies that have used cognitive bias modification (CBM) methods to manipulate abstract and concrete modes of processing *prior* to stressful events. For example, Watkins, Moberly and Moulds (2008) trained non-depressed individuals to think about positive and negative scenarios in a mode consistent or inconsistent with an abstract-evaluative mind-set. They found that individuals trained in an abstract mode displayed more depressive symptoms after failing at a task than those who were trained in a mode antithetical to depressive rumination (i.e. in a concrete-experiential mind-set). Stemming from this, proof-of-principle studies that have deliberately trained dysphoric individuals to adopt a concrete mode of processing have been shown to be of benefit in reducing depressive symptoms (Watkins, Baeyens, & Read, 2009; Watkins & Moberly, 2009). This has led on to the development and evaluation of specific CBM interventions for those most at-risk of developing depressive disorders (Watkins et al., 2011, 2012).

1.3. Processing mode theory applied to PTSD

Since depression and PTSD share many common features, such as overgeneralised appraisals and a ruminative style of thinking, it appears highly relevant to explore the processing mode theory in relation to PTSD. In their cognitive model of PTSD,

Ehlers and Clark (2000) propose that processing of a traumatic event in a way that induces a sense of current threat is key to the maintenance of PTSD. They argue that a sense of current threat typically results from excessive negative appraisals of the trauma and/or its sequelae and a disturbance in autobiographical memory of the event, which is poorly elaborated and contextualised. Applying Watkins' processing mode theory to PTSD, the hypothesis would be that *abstract*, overgeneralised, thinking about the trauma is a form of cognitive avoidance, and would interfere with the processes of elaboration and contextualisation of the event memory and maintain excessively negative trauma-related appraisals. On the other hand, *concrete* processing would be expected to facilitate the elaboration of the trauma memory and the modification of excessive negative appraisals, therein reducing the likelihood of PTSD symptomatology. If evidence were found that training individuals in concrete processing is protective against PTSD symptom development, there would be a strong argument for the development of early intervention programmes to provide such training, as has been the case with depression. Support for this hypothesis is however currently in its infancy, with analogue trauma studies manipulating processing mode leading the way.

Ehring et al. (2009) tested whether the dysfunctional effects of trauma-related rumination could be accounted for by reduced concreteness of thinking by randomly allocating participants to either an abstract ruminative thinking, concrete thinking or a distraction control condition *following* exposure to an analogue trauma. Consistent with the literature on depression, the authors found that abstract thinking led to a significantly longer maintenance of negative mood and arousal than both concrete thinking and distraction conditions. They argued that the abstractness of ruminative thinking may have helped to strengthen the dysfunctional appraisals of the trauma, and therefore perpetuated the negative mood and arousal. However, the authors failed to find differential effects of the manipulation on intrusive memories, the hallmark symptom of PTSD. They only found indirect evidence for the idea that concrete thinking is more functional than abstract thinking as only the concrete condition reported significantly fewer intrusive memories than the control. The authors call for a replication of the findings before firm conclusions are drawn.

In a semi-replication study, Santa Maria et al. (2012) did find differential effects of abstract and concrete processing modes in relation to intrusive memories, although their analogue methodology differed. The authors found that participants who were asked to write in an abstract-evaluative way about a distressing life event experienced less of a reduction in intrusive memories both during and after the test session than participants who wrote about their distressing event in a concrete-experiential way. Taken together, these findings provide early support for the hypothesis that an abstract mode of processing adopted *following* trauma can partially account for the negative outcomes seen in PTSD.

In relation to the role of processing mode *during* trauma, White and Wild (under revision) trained healthy participants in either a concrete or an abstract mode of processing during exposure to analogue trauma films and found that training in concrete processing led to fewer intrusions and associated PTSD symptoms in the week after compared with training in abstract processing. Although this study provides promising evidence that concreteness training during exposure to analogue trauma may prove a valuable tool in the prevention of specific PTSD symptoms, the authors note in their limitations that a lack of a "no-training" control condition made it unclear whether the results they found were mainly due to the dysfunctional effects of abstract training, the functional effects of the concrete training, or both. It is also unclear whether concrete training is better than what individuals do naturally during exposure to analogue trauma. They called for future studies to include such a control to clarify the direction of the effect and to provide an insight into the default response of untrained individuals.

Further support for the beneficial effects of concrete training in relation to trauma comes from Laposa and Alden (2006). They interviewed emergency service workers to elicit cognitive coping strategies perceived to be the most effective in regulating emotions when dealing with traumatic situations, and then manipulated healthy participants' use of these strategies using the trauma film paradigm. In the first study, functional cognitive strategies used and judged by the workers to be most effective during medical crises were: "attending to the mechanical steps of medical treatment", "focusing on events and processes occurring in the here and now", and "recalling and applying prior training to solve medical problems".

Participants in the second study were asked to watch a video of real events in a hospital emergency room either in a "medical focus" way or were given no instructions (control). The "medical focus" group was asked to "focus on the medical procedures being used by the medical staff and think about what the staff are trying to accomplish". The control group was asked to simply watch the events. As predicted, the medical focus group reported significantly fewer intrusions during the following week compared with controls. The authors inferred that these strategies facilitated verbal-conceptual processing, therefore promoting more functional processing of the trauma and protecting against the development of intrusive memories.

1.4. Study rationale

To date, most research has investigated cognitive processing *post*-trauma. Yet at-risk groups have the opportunity to adopt potentially protective cognitive strategies *during* trauma since they often know beforehand when they will be exposed to trauma. Preliminary evidence suggests that concrete peri-traumatic processing leads to fewer intrusive memories and PTSD symptoms compared to abstract processing. However, it is unclear whether the initial promising effects of concrete processing training can be replicated and whether they are likely to be more beneficial than natural processing. The present study investigated these possibilities.

We were also interested in exploring the effects of peri-traumatic processing modes on different types of intrusive memories, since the extant research has not often distinguished intrusive visual images from intrusive verbal thoughts or affect-based intrusions. Although the DSM-IV stipulates that re-experiencing in PTSD can take the form of "distressing recollections of the event, including images, thoughts or perceptions'' (American Psychiatric Association, 1994), there is some uncertainty in the literature as to their relative frequency and the causal mechanisms of these different types of recollection. For example, some studies indicate that image-based intrusions are quite common, and thought-based intrusions are relatively rare (Ehlers et al., 2002; Mellman & Davis, 1985), whereas others have found thought-based intrusions to be more prominent (Reynolds & Brewin, 1998). Hagenaars, Brewin, van Minnen, Holmes, and Hoogduin (2010)

propose that intrusive images and intrusive thoughts are different phenomena that arise from independent memory systems, and require different levels of processing. It was therefore of interest to investigate the effect of processing mode training on different types of intrusions in order to shed further light on this hypothesis.

Finally, although intrusions are a key indicator of PTSD, they are only one measurement of PTSD symptomology. Another marker of PTSD is the disturbance in autobiographical memory for the trauma. One hypothesis about the effects of training in peri-traumatic abstract processing would be that a focus on *"why"* and *"what-if"* questions might prevent the formation of a coherent trauma memory. The more the person is caught up in *"why"* and *"what-if"* thinking, the less able they may be to focus on the experience of the trauma as it is actually happening. A processing mode theory of PTSD would predict that abstract peri-traumatic processing would lead to poorer recognition memory for details relating to the trauma and a more incoherent trauma narrative. The present study sought to test this hypothesis.

1.5. Study aims

The primary aim of the study was to investigate the hypothesis that training in abstract processing *during* exposure to analogue trauma is more harmful than training in concrete processing in relation to intrusive memory development, associated PTSD symptoms, and the accuracy and coherency of the trauma memory. Secondary aims of the study were to explore the effects of processing mode training on different types of intrusions, to investigate the differences between concrete processing and natural processing in relation to the trauma outcomes mentioned above, and to identify the content of natural cognitive processing during exposure to analogue trauma. In this way, the present study can be seen as a replication of White and Wild (under revision), but with an additional control group and with the inclusion of additional outcomes.

1.6. Research hypotheses

1.6.1. Primary hypotheses

1) Training in concrete processing will lead to fewer intrusive memories (total number of intrusions) and associated PTSD symptoms (measured by post IES-R) at one week follow-up compared with training in abstract processing.

2) Training in concrete processing will lead to better recognition memory (total number of items correct on a recognition memory test), better recognition accuracy (hits – false positives) and a more coherent trauma recall narrative at one week follow-up compared with training in abstract processing.

1.6.2. Questions to explore

1) To explore the relationship between training in concrete processing and natural processing (no training) in relation to intrusive memories, PTSD symptoms, recognition memory, recognition accuracy and trauma recall narrative coherency at one week follow-up.

2) To explore the effects of concrete processing, abstract processing and natural processing (no training) on different types of intrusions (thought-, image-, and affect-based) at one week follow-up.

3) To explore what natural cognitive processing during exposure to analogue trauma consists of.

2. METHOD

2.1. Design

The trauma film paradigm was used in the present study as a means of providing analogue trauma (Holmes & Bourne, 2008). A between-subjects design was used, whereby participants were randomly allocated to one of three groups prior to watching the films: abstract training, concrete training or no training (control). All participants watched a 'baseline' traumatic film clip, followed by processing mode training on six traumatic film clips, and ending with a 'test' traumatic film clip to be

watched in the mode they had been trained in. The control group watched all the films without any training. Questionnaires were administered prior to the baseline film, after the test film and at one-week follow-up.

The independent variable was training condition (three levels: abstract vs. concrete vs. control).

The main dependent variables were:

1) Number and type (image-, thought- or affect-based) of spontaneously occurring intrusive memories experienced over the following week after trauma film viewing.
2) Severity of post traumatic symptomatology at one-week follow-up as measured by the IES-R (Impact of Events Scale - Revised, Weiss & Marmar, 1997).
3) Recognition memory for the trauma films at one-week follow-up as measured by total number of correctly recognized target items (hits) on a verbal YES/NO memory questionnaire and recognition accuracy (hits - false positives).
4) Memory coherence in relation to the test trauma film at one-week follow-up, as measured by a free-recall narrative of the test film content scored for coherency.

2.2. Participants

The sample consisted of 73 university staff and students (68.5% female) from King's College London who responded to an email circular advertising the study. Participants ranged from 18-43 years, with a mean age of 23.49 (4.99 SD). Participants were excluded if they had a current self-reported mental health problem, or if they scored above clinical cut-offs on standard measures of depression and post-traumatic stress, as such individuals were deemed to be at increased risk of emotional distress from the trauma films. Depression was assessed using the Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer, & Williams, 2001), using a greater than 10 cut off (*moderate depression,* Shaw, Vallis, & McCabe, 1985). Post-traumatic stress symptoms were assessed using the Impact of Events Scale – Revised (IES-R; Weiss & Marmar, 1997), using a greater than 33

cut off recommended by Creamer, Bell, and Failla (2003). In addition, participants who were medically trained were excluded from participation since they were expected to show a reduced response to the analogue stressor used in this study, in keeping with White and Wild (under revision) and Ehring et al. (2009).

2.3. Ethical approval

Full ethical approval was granted by the Psychiatry, Nursing and Midwifery Research Ethics Committee at Kings College London (see Appendix, section 6.1).

2.4. Power analysis

As the proposed study was a between subjects design with three groups, setting power at 80% (the proposed convention for general use) and the alpha level at .05, Cohen (1992) was consulted to determine the sample size needed to detect a large effect size. The power calculation showed that a sample size of 21 in each group would have 80% power to detect a significant difference in mean change scores between the three groups using a 3-way ANOVA with a .05 two-sided significance level (large effect size). It was therefore concluded that a minimum of 63 participants (21 in each group) would be needed for ANOVA comparisons between three groups.

2.5. Measures

Published measures with established psychometric properties were used wherever possible. However, for some variables for which no existing measure had been validated, it was necessary to use or develop unpublished measures. All measures can be found in the Appendices (Sections 6.4 – 6.13).

2.5.1. Prior trauma exposure

Trauma screener (unpublished)

The *Trauma screener* is a 16-item, self-report checklist of common traumatic events. The measure was derived from the trauma checklist included in the Clinical Administered Post-Traumatic Scale (Blake et al., 1990) and has been used in previous studies (Shepherd & Wild, 2013, 2014). This measure was included in the present study to ensure equivalence of prior trauma exposure between the groups, and to establish an index event for the baseline IES-R.

2.5.2. PTSD symptoms

Impact of Events Scale – Revised (IES-R; Weiss & Marmar, 1997)

The *IES-R* is a 22-item, self report measure of post-traumatic stress symptoms. The measure has been used widely in both clinical and research settings, and has been validated with both non-clinical and clinical populations (Creamer et al., 2003; Weiss & Marmar, 1997). It has demonstrated excellent internal consistency for the total scale (α = .96) and for its three subscales (α = .87-.94 for the intrusion scale, α = .84-.87 for the avoidance scale and α = .79-.91 for the hyperarousal scale). Test-retest reliability coefficients range from *r* = .5-.9 for the total scale; *r* = .57-.94 for the intrusion scale; *r* = .51-.89 for the avoidance scale and *r* = .59-.92 for the hyperarousal scale. Concurrent validity has been documented with high correlation (r = .84) between the IES-R and the PTSD Checklist (Weathers, Litz, Herman, Huska, & Keane, 1993). This IES-R was used in the present study to assess levels of post-traumatic stress symptoms at baseline (screening measure) and at one week follow-up.

2.5.3. Depression symptoms

Patient Health Questionnaire – 9 items (PHQ-9; Kroenke et al., 2001)

The *PHQ-9* is a brief, 9-item, self report measure of depression, which reflects the DSM-IV criteria for depression. The scale yields a total score of 27, with higher scores indicating greater severity. Total PHQ-9 scores of 5, 10, 15, and 20 represent valid thresholds demarcating the lower limits of *mild*, *moderate*, *moderately severe*, and *severe* depression (Kroenke et al., 2001). The PHQ-9 has been validated in clinical and non-clinical populations (Kroenke et al., 2001; Zhang et al., 2013). It has demonstrated high internal consistency (α = .86 to .89) and high test-retest reliability, as well as criterion validity and construct validity. The PHQ-9 was used in the study to ensure equivalence of depressive symptoms between groups at baseline, and as a screening measure.

2.5.4. Demographic information

General Information Questionnaire (GIQ; unpublished)

The 10-item *General Information Questionnaire* was used to elicit demographic information. It was adapted for the present study to include a question on driving

status. Since five of the eight film clips contained footage of road traffic accidents, this question was included to ensure equivalence of driving status between groups.

2.5.5. Trait anxiety

State-Trait Anxiety Inventory – Trait version (STAI-T; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983)

The *STAI-T* is a 20-item, self-report questionnaire, which measures individual proneness to anxiety (trait anxiety). Scores range from 20-80, with higher scores indicating a higher level of trait anxiety. The *STAI-T* has been used widely in research and clinical practice, and has good internal consistency (α = .86 to .95), high test-retest reliability ranging from r = .65 to r = .75, and good construct and concurrent validity (Spielberger et al., 1983; Spielberger, 1989). It was included in the study to ensure equivalence in trait anxiety between groups.

2.5.6. Trait rumination

Perseverative Thinking Questionnaire (PTQ; Ehring et al., 2011)

The PTQ is a 15-item, self-report questionnaire, designed to measure repetitive negative thinking (RNT) processes (e.g. rumination). The scale yields a total score of 60, with higher scores indicating a greater tendency towards RNT. The scale has been shown to have good psychometric properties, including excellent internal consistency for the total scale (α = .95), acceptable – high internal consistencies for the three subscales (α = .94, α = .83, and α = .86 respectively), satisfactory test-retest reliability for the total scale (r_{tt} = .69) and for the three subscales (r_{tt} = .66, r_{tt} = .68 and r_{tt} = .69 respectively). The PTQ has also demonstrated convergent validity with significant correlations between other measures of RNT, namely the rumination scale of the Response Style Questionnaire (Nolen-Hoeksema & Morrow, 1991) (r = .72), the Penn State Worry Questionnaire (Meyer, Miller, Metzger, & Borkovec, 1990)(r= .70) and the Rumination Scale (McIntosh, Harlow, & Martin, 1995)(r = .62). The PTQ was used in the present study to assess trait rumination and the potential relationship with PTSD symptoms at follow-up.

2.5.7. Trait dissociation

Trait Dissociation Questionnaire – short version (TDQ; Murray, Ehlers, & Mayou, 2002)

The TDQ (short version) is an 11-item self-report measure of trait dissociation. The full version contains 38 items and has been shown to have high internal consistency (α = .93) and good re-test reliability (*r* = .86), and was predictive of intrusive memories in a student population (Murray, 1997). The shorter version was validated with an outpatient sample, showing high correlation with the original TDQ (*r* = .94), good internal consistency (α = .86) and adequate retest reliability (*r* = .56) (Murray et al., 2002). The TDQ was used in the present study to assess participants' levels of trait dissociation, and to see what relationship this had to subsequent intrusive memory development.

2.5.8. Proneness to intrusive memories

Proneness to intrusions scales (unpublished)

A three item, self-report measure of proneness to intrusive memories was used to assess participants' proneness to negative and positive intrusions. It was also used to investigate the relationship between these and the subsequent development of intrusions after trauma film viewing. Participants are required to circle on a 5-point Likert scale (0-5; not at all – everyday) how often in a week particular memories of stressful/unpleasant events, unpleasant events they watch on television or happy/pleasant events tend to pop into their mind. These scales were developed for use in a similar study (White & Wild, under revision).

2.5.9. Emotional reactivity, personal relevance and mood ratings

Emotional reactivity scales (unpublished)

Three scales assessing emotional reactivity to the films were given to participants after viewing the baseline and test films. These scales were used to ensure equivalence of emotional reactivity between groups at baseline, and to assess the effect of training condition on emotional reactivity to the trauma films over time. Participants were asked to rate on an 11-point Likert scale (0, none – 10, extreme) how much distress, horror and activation they experienced after watching the films. Distress and horror were chosen as self-report ratings as an effect of appraisal training on these emotions in reaction to distressing films has been

found in the literature (Schartau, Dalgleish, & Dunn, 2009). A subjective level of arousal (named "activation" to avoid confusion) was also included given that higher post-trauma arousal has been linked to the subsequent development of PTSD (O'Donnell, Elliott, Lau, & Creamer, 2007).

Personal relevance scale (unpublished)

Personal relevance of the pre- and post-training films was assessed with an 11-point Likert scale (0, none – 10, extreme). The scale was used to assess the extent to which participants thought about themselves in relation to the film clips. It was of interest to investigate potential differences between groups in personal relevance of the film pre- to post training, as the abstract group were explicitly instructed to relate the films to their own lives and both the concrete and control groups weren't.

Mood scale (unpublished)

An 11-point Likert scale (0, extremely negative – 10, extremely positive) was used to assess participants' self-reported mood before and after training.

2.5.10. Manipulation checks

Attention and adherence to processing mode checks (unpublished)

In order to check participant attention to the final film, and adherence to their allocated processing mode, two 11-point Likert scales were used after the test film. Participants were asked to self-report what percentage of the time they thought they had paid attention to the film, and what percentage of the time they had watched the film in accordance with the instructions given to them. Participants whose attention or adherence to the final film was 50% of the time or less were excluded from the analysis, in keeping with White and Wild (under revision).

2.5.11. Intrusion diary and compliance

Intrusion diary (unpublished)

Participants were asked to record the number and type (image-, thought-, or affect based) of intrusive memories they experienced in the week following film viewing in an online diary. Participants were sent daily email reminders to ensure accurate adherence to the diary. Intrusion diaries are a standard way of assessing frequency

of intrusions and have been used extensively in trauma film research (Holmes & Bourne, 2008).

Intrusion diary compliance (unpublished)

At the end of the week, participants were asked to self-report how well they managed to complete the diary accurately for the intrusions they experienced on a 5-point Likert scale (0, not at all – 5, always).

2.5.12. Memory measures

As part of the follow-up questionnaires, participants were given a surprise online memory test one-week after viewing the films. The memory test was split in to two parts.

Memory coherence test (unpublished)

Participants were asked to write down as much as they could remember about the final (test) film that they had watched using a free-text box with no character limit. Their memory narratives were later coded for coherence, with a scoring system adapted from Halligan, Michael, Clark and Ehlers (2003). All narratives received a 'trauma-recall incoherence score' out of 3, scoring 1 point for 'any key missing details', 1 point for 'inability to remember the film content', and 1 point for 'a narrative that was out of sequence'. All narratives were scored by the author, and 20% were scored by a psychologist colleague for inter-rater reliability. Cohen's Kappa was calculated as a measure of agreement between the raters, and was found to be 0.90, which represents almost perfect agreement (Landis & Koch, 1977).

Recognition memory test (unpublished)

Participants were asked to answer 32 recognition memory questions about the content of the films they watched (four questions relating to each of the eight films). The design of the memory test was based on recognition memory tests used in previous analogue trauma film studies (Holmes, Brewin, & Hennessy, 2004; Krans, Näring, Holmes, & Becker, 2009). It contained statements relating to the visual elements of the films (rather than the contextual narrative) that participants had to decide whether they were true or false. The items were presented in

chronological order, thereby allowing participants to think through the film in a structured and detailed way.

2.6. Materials

Eight video clips of real life footage from road traffic accidents, bull fights and terrorist attacks (depicting dead bodies, injured humans and animals in distress) served as the analogue trauma stressors. Each scene was briefly introduced by a female voice providing contextual information. The trauma clips used in this study have been used in previous studies (Schartau, Dalgleish, & Dunn, 2009; Steil, 1997; White & Wild, under revision), and have been shown to reliably induce negative mood and analogue post-traumatic stress symptoms, such as intrusive memories (e.g. Halligan, Clark, & Ehlers, 2002). The eight film clips ranged from 21 to 137 seconds with a mean length of 89 seconds (SD = 35.88). They were presented on a 13-inch laptop screen using the software QuickTime Player.

2.7. Procedure

An overview of the study procedure is illustrated in Figure 1. All study documentation can be found in the Appendices.

Having read and considered the information sheet (Appendix, section 6.2), participants were invited to a testing session at King's College London. Written consent was obtained (Appendix, section 6.3), and screening questionnaires (Trauma screener, IES-R, PHQ-9) were administered. Eligible participants then completed a series of baseline measures (GIQ, STAI-T, PTQ, TDQ, proneness to intrusions and mood rating), before being randomly allocated to one of three training conditions (abstract, concrete or control) for the film task. Following the film task, participants were shown and emailed a link to an online intrusion diary. One week after the test session, participants completed an online intrusion diary compliance measure, a surprise memory test for the films, and a post- IES-R. Upon completion, participants were posted a £15 payment and a written debrief of the study (Appendix, section 6.14).

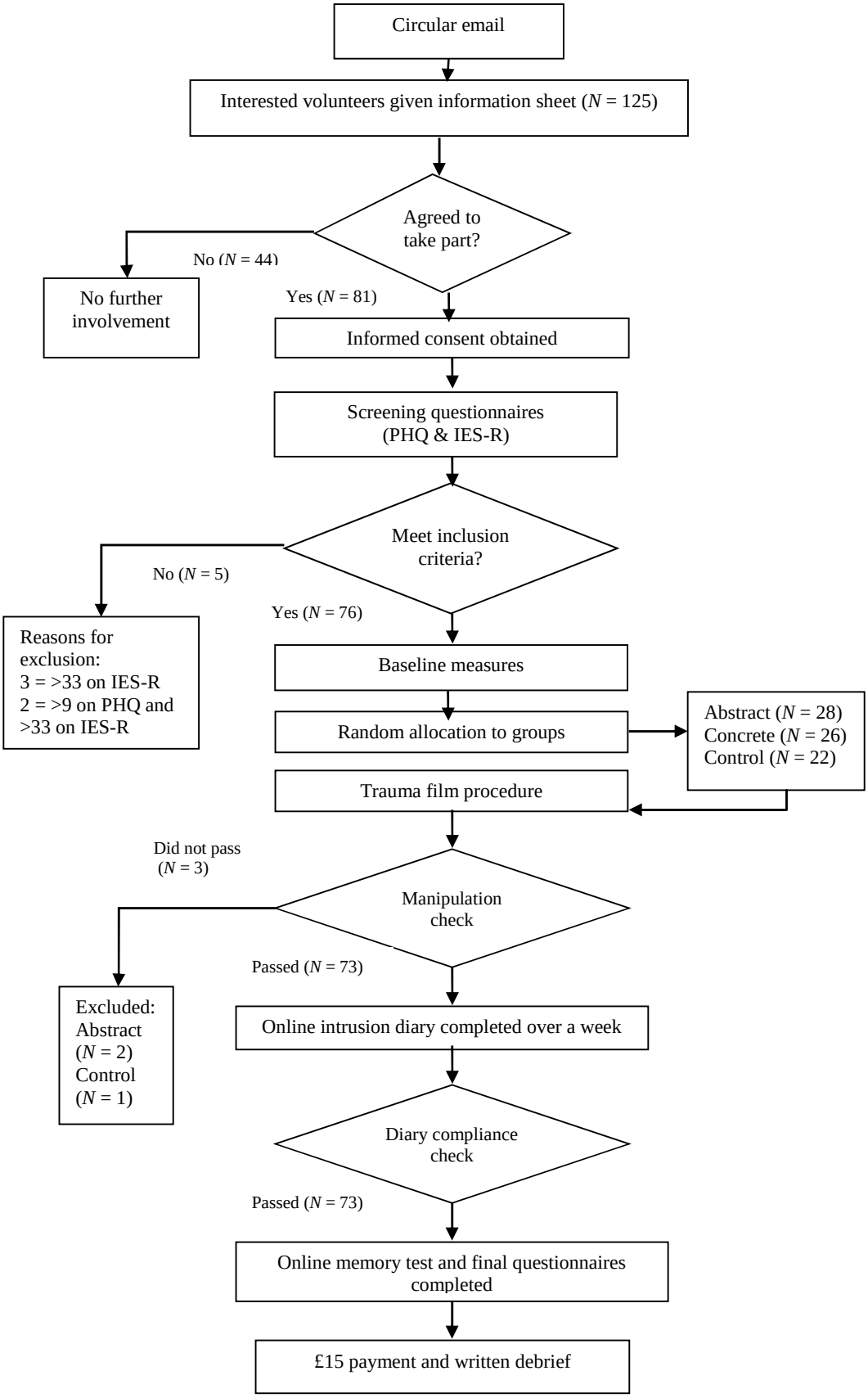

Figure 1. An overview of the study procedure

2.7.1 Film task procedure

An overview of the trauma film procedure is provided in Figure 2. Having completed the baseline measures and provided a mood rating, participants were randomly allocated to one of three processing mode conditions (abstract vs. concrete vs. control). All participants were told that their task involved watching a series of film clips of real-life traumatic footage, in a particular way, according to some instructions they were to be given. For the baseline film, all participants were told to 'simply watch the film as you would normally watch any film', and completed measures of emotional reactivity and personal relevance afterwards. Following the baseline film, participants were given instructions as to how to watch the next series of films according to the condition they had been assigned to. The abstract and concrete instructions were modified (shorter) versions of the instructions used by White and Wild (under revision), which had worked well in a study designed to induce then modify responses to intrusive memories (Wild, Byrne, & Ehlers, 2014).

Participants in the **abstract condition** were given the following instructions:

'Whilst watching each film, focus on:

- Why do things like this happen?
- What does it mean about the world?
- What if this had happened to you, or someone in your family?'

As well as: "Fully absorb yourself in the film, and watch with your full attention immersed in the film"

Participants in the **concrete condition** were given the following instructions:

'Whilst watching each film, focus on:

- What happens moment by moment
- What you can see and hear
- What needs to happen step-by-step from here'

As well as "Fully absorb yourself in the film and watch with your full attention immersed in the film"

In the **control condition**, participants were not given any processing mode instructions, but were given the following instructions:

'Whilst watching each film:

- Fully absorb yourself in the film
- Watch with your full attention immersed in the film'

Participants were reassured that there were no right or wrong responses and that the instructions were simply guides for them to know how to watch the film. They were encouraged to try and focus on the instructions and have them in their minds for the duration of the clips. Before each film participants were reminded verbally and visually of their instructions.

In order to check whether participants in the abstract and concrete groups had adopted the correct processing mode, after the baseline and the training films, participants were asked to give examples of what they were thinking about whilst watching the film. Where participants demonstrated difficulty applying the required processing mode, examples of thoughts in line with their processing mode were given as examples for them to adopt. Control group participants were also asked after each film what thoughts they were having whilst watching the film, but were not given any feedback.

After each film, the word '*relax'* appeared on the screen for five seconds, which aimed to minimise any accumulative effect of the training phase on mood. After the training films and before the test film, a second mood rating was obtained. For the test film, participants were told to watch the final film in 'exactly the same way' as they had been watching the other films. Following the test film, participants completed the emotional reactivity, personal relevance and manipulation checks and were then shown how to use the online intrusion diary. The experimenter made sure that participants felt well before leaving the testing session and encouraged them to contact her if they felt distressed about the experiment in any way. No participant took up this option.

One week after the testing session, participants were sent an email with a link to an online follow-up questionnaire containing a diary compliance measure, an IES-R and a surprise recall and recognition memory test. All participants received a payment of £15 compensation for their time, as well as a written debrief of the study after completion of the online follow-up measures. Prior to the commencement of the main study, a pilot study was conducted to assess the feasibility of this methodology.

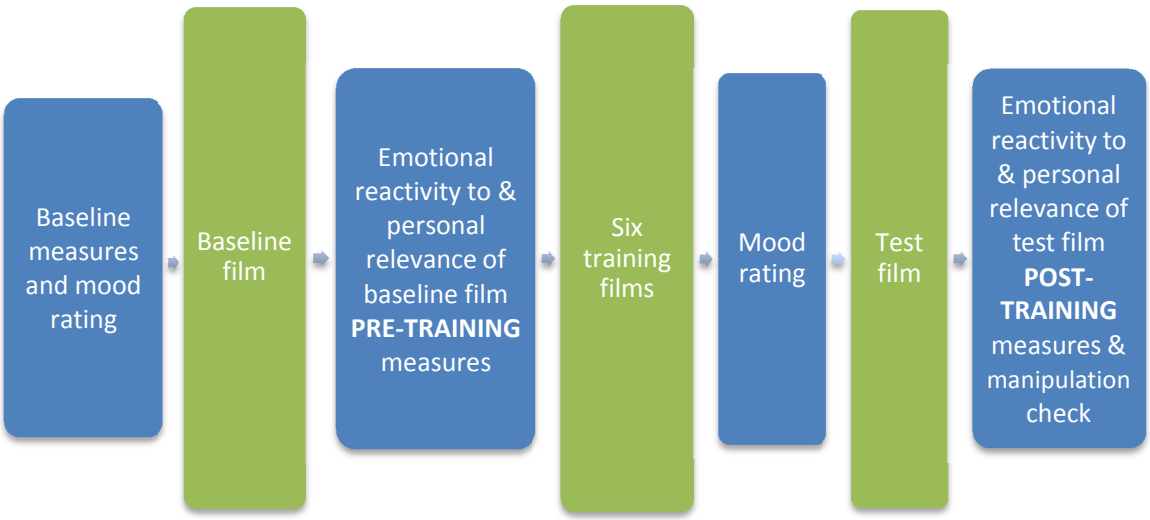

Figure 2. An overview of the trauma film procedure

2.8. Statistical analysis

Three-way analyses of variance, analyses of covariance and chi-squared tests were conducted to investigate possible pre-experimental group differences in baseline measures, manipulation and diary compliance checks, as well as for the number and type of intrusive memories, IES-R scores, memory recognition and recall scores one week post experiment. Mixed ANOVAS (3 x 2) were conducted to compare pre and post training emotional reactivity (distress, horror and arousal) between the three groups, as well as pre and post training measures of mood and personal relevance of the baseline and test film clips.

3. RESULTS

Variables were assessed for normality by obtaining values of skewness and kurtosis and calculating their associated z-scores. According to Field (2009), a z-score greater than 1.96 is significant at the $p<.05$ level, above 2.58 is significant at the $p<.01$ level and above 3.29 is significant at $p<.001$. Variables with z-scores of 1.96 and above were inspected visually using histograms and Q-Q plots. Variables that violated assumptions of normality were log10 or square root transformed where appropriate. Homogeneity of variance was assessed with Levene's test before using parametric tests. Observed rather than transformed values are reported in tables for the purposes for readability, but the results of statistical testing are based on analyses using transformed variables where applicable. Measures of effect size were also calculated to determine the importance of the effect using partial-eta squared (η^2_p) or Cramer's *v* as appropriate. For effects sizes derived using partial eta-squared (η^2_p) (AN(C)OVAs), $\eta^2_p = .01$ represents a small effect size, $\eta^2_p = .06$ a medium effect size and $\eta^2_p = .14$ a large effect size (Cohen, 1988). For effect sizes derived using Cramer's *v* (chi-squared tests), $v = 0.1$ represents a small effect size, $v = 0.3$ represents a medium effect size, and $v = 0.5$ a large effect size (Cohen, 1992). All analyses used a two-tailed significance level of $\alpha = .05$. Data were analysed using SPSS Statistics (V.21).

Three participants failed the adherence check relating to the experimental manipulation, reporting 50% (or less) adherence to the instructions for the final test film. Two participants had been allocated to the abstract condition, and the third was from the control group (See Figure 1). These data were excluded from analysis for failing to meet reliability standards.

Table 1. Sample demographics by group

		Total sample (N = 73) *M (SD) or N (%)*	**Abstract (n = 26)** *M (SD) or N (%)*	**Concrete (n = 26)** *M (SD) or N (%)*	**Control (n = 21)** *M (SD) or N (%)*	**Statistics**
Age		23.49 (4.99)	24.50 (5.99)	22.85 (4.78)	23.05 (3.75)	$F(2, 46.40)=0.68$, $\eta^2_p = .02$, $p = .51$
Gender	Female	50 (68.5%)	19 (26.0%)	15 (20.5%)	16 (21.9%)	$\chi^2(2, 73)=2.24$, v = .18, $p = .33$
	Male	23 (31.5%)	7 (9.6%)	11 (15.1%)	5 (6.8%)	
Ethnicity	Caucasian	46 (63.0%)	19 (26.0%)	16 (21.9%)	11 (15.1%)	$\chi^2(2, 73)=2.17$, v = .17, $p = .34$
	Other	27 (37.0%)	7 (9.6%)	10 (13.7%)	10 (13.7%)	
English first language	Yes	56 (76.7%)	18 (24.7%)	21 (28.8%)	17 (23.3%)	$p = .64$, v = .13
	No	17 (23.3%)	8 (11.0%)	5 (6.8%)	4 (5.5%)	
Marital status	Single	65 (89.0%)	23 (31.5%)	24 (32.9%)	18 (24.7%)	$p = .89$, v = .09
	Married	8 (11.0%)	3 (4.1%)	2 (2.7%)	3 (4.1%)	
Occupation	Student	50 (68.5%)	16 (21.9%)	20 (27.4%)	14 (19.2%)	$\chi^2(2, 73)=1.47$, v = .14, $p = .48$
	Employed	23 (31.5%)	10 (13.7%)	6 (8.2%)	7 (9.6%)	
Years in education		16.05 (2.61)	16.00 (2.53)	15.58 (2.76)	16.71 (2.50)	$F(2, 70)=1.12$, $\eta^2_p = .03$, $p = .33$
Highest qualification	A-levels	36 (49.3%)	12 (16.4%)	16 (21.9%)	8 (11.0%)	$p = .46$, v = .16
	Undergraduate degree	17 (23.3%)	5 (6.8%)	5 (6.8%)	7 (9.6%)	
	Postgraduate degree	20 (27.4%)	9 (12.3%)	5 (6.8%)	6 (8.2%)	
Car driver	Yes	38 (52.1%)	10 (13.7%)	16 (21.9%)	12 (16.4%)	$\chi^2(2, 73)=3.08$, v = .21, $p = .21$
	No	35 (47.9%)	16 (21.9%)	10 (13.7%)	9 (12.3%)	

N.B. For the 'Age' variable, Levene's test of homogeneity of variance was significant (p = .042), and therefore Welch's F-ratio is reported. For the 'English first language', 'Marital status' and 'Highest qualification' variables, some expected cell counts were <5, so Fisher's exact test p-values are reported.

3.1. Participant demographics

Table 1 shows the means and standard deviations of continuous participant demographics, and frequency data for categorical demographics.

3.2. Group comparisons at baseline

One-way ANOVAs for 3 groups (abstract vs. concrete vs. control) were conducted to investigate possible pre-experimental differences between groups in relation to continuous baseline measures. Chi-squared or Fisher's exact tests were used to test for baseline differences of categorical variables.

3.2.1. Demographic comparisons

As shown in Table 1, means and standard deviations of sample demographics were statistically compared between groups. Statistical testing revealed no significant differences in age, gender, ethnicity, English as a first language, marital status, occupation, years in education, highest qualification or car driver status between groups.

3.2.2. Baseline self-report measures

Table 2 compares means and standard deviations of baseline self-report measures between the groups. There were no significant differences between the three groups prior to the experimental manipulation in baseline symptoms of depression (PHQ-9), PTSD (IES-R), prior trauma exposure (Trauma screener) trait anxiety (STAI-T), trait rumination (PTQ), trait dissociation (TDQ), self-reported proneness to intrusive memories after stressful events (PT1), after watching unpleasant scenes on television (PT2) or after experiencing positive events (PT3). All participant scores on the baseline IES-R and PHQ-9 were below clinical cut-offs.

3.2.3. Correlations between baseline self-report measures and PTSD outcome measures

Table 3 shows the Pearson's correlations that were conducted to investigate the relationships between baseline measures and PTSD outcome measures (total

number of intrusions, image-, thought-, affect-based intrusions and post IES-R). Statistical analysis revealed no significant relationships between any of the baseline measures and the intrusion variables, but significant relationships between most of the baseline variables and post IES-R scores.

Table 2. Means, standard deviations and ANOVAs of baseline measures by group

	Total sample (N = 73) *M (SD)*	**Abstract (n = 26)** *M (SD)*	**Concrete (n = 26)** *M (SD)*	**Control (n = 21)** *M (SD)*	**Statistics**
Depression (PHQ-9)	2.10 (2.20)	1.58 (1.58)	2.46 (2.75)	2.29 (2.08)	$F(2, 43.07)=1.42$, $\eta^2_p = .03$, $p = .25$
PTSD (pre IES-R)	8.27 (9.12)	6.27 (6.82)	9.35 (10.4)	9.43 (9.90)	$F(2, 70)=.98$, $\eta^2_p = .03$, $p = .38$
Number of previous traumatic events (Trauma screener)	1.82 (1.07)	1.88 (1.21)	1.88 (1.07)	1.67 (0.91)	$F(2, 70)=.30$, $\eta^2_p = .01$, $p = .74$
Trait anxiety (STAI-T)	35.58 (7.89)	35.88 (6.80)	34.50 (9.23)	36.52 (7.56)	$F(2, 70)=.41$, $\eta^2_p = .01$, $p = .67$
Trait rumination (PTQ)	17.49 (8.79)	17.27 (8.32)	18.92 (13.43)	16.00 (11.42)	$F(2, 70)=.40$, $\eta^2_p = .01$, $p = .67$
Trait dissociation (TDQ)	8.79 (6.95)	9.08 (5.84)	9.88 (8.14)	7.10 (6.60)	$F(2, 70)=.97$, $\eta^2_p = .03$, $p = .38$
Proneness to intrusions: stressful events (PT1)	1.30 (.94)	1.08 (.56)	1.50 (1.21)	1.33 (.91)	$F(2, 40.32)=1.62$, $\eta^2_p = .04$, $p = .21$
Proneness to intrusions: television scenes (PT2)	.92 (.81)	0.85 (.46)	1.08 (1.02)	0.81 (0.87)	$F(2, 39.04)=.61$, $\eta^2_p = .02$, $p = .55$
Proneness to intrusions: positive events (PT3)	2.26 (1.01)	2.15 (0.93)	2.50 (0.99)	2.10 (1.14)	$F(2, 70)=1.15$, $\eta^2_p = .03$, $p = .32$

Key: (PHQ-9) = Patient-Health Questionnaire – 9 items; (IES-R) = Impact of Events Scale-Revised; (STAI-T) = State-Trait Anxiety Inventory-Trait version; (PTQ) = Perseverative Thinking Questionnaire; (TDQ) = Trait Dissociation Questionnaire.
N.B. For the PHQ-9, the PT1 and PT2 variables, Levene's tests of homogeneity of variance were significant ($p = .046$; $p<0.01$; $p = .015$ respectively), and therefore Welch's F-ratios are reported.

Table 3. Pearson correlations between baseline variables and PTSD outcomes

	Total intrusions		Thought intrusions		Image intrusions		Affect intrusions		PTSD (post IES-R)	
	r	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*
PHQ-9	-.03	.78	-.02	.90	-.09	.43	.07	.54	.24*	.045
IES-R (baseline)	.12	.30	.01	.93	.09	.46	.22	.07	.33**	.004
Number of previous traumatic events (Trauma screener)	-.07	.55	-.07	.58	-.12	.29	.09	.44	.11	.34
STAI-T	.10	.42	.07	.59	.04	.71	.12	.31	.45**	<.001
PTQ	.14	.25	.10	.41	.10	.39	.12	.31	.48**	<.001
TDQ	.04	.75	.15	.22	-.05	.65	.003	.98	.43**	<.001
Proneness to intrusions: stressful events (PT1)	.03	.82	-.04	.76	.06	.62	.05	.67	.39**	.001
Proneness to intrusions: television scenes (PT2)	.21	.08	.09	.44	.16	.17	.11	.36	.41**	<.001
Proneness to intrusions: positive events (PT3)	-.13	.26	-.20	.09	-.06	.61	-.10	.41	-.14	.23

Key: (PHQ-9) = Patient-Health Questionnaire – 9 items; (IES-R) =Impact of Events Scale-Revised; (STAI-T) = State-Trait Anxiety Inventory-Trait version; (PTQ) = Perseverative Thinking Questionnaire; (TDQ) = Trait Dissociation Questionnaire

*Significant at the $\alpha = .05$ level, **Significant at the $\alpha = .01$ level

3.2.4. Responses to baseline film (pre-training measures)

There were no significant differences in ratings of mood prior to watching the baseline film, $F(2, 70)=.49$, $\eta^2_p=.01$, $p=.62$, or horror, $F(2, 70)=2.58$, $\eta^2_p=.07$, $p=.08$, distress, $F(2, 70)=2.86$, $\eta^2_p=.08$, $p=.06$, or activation reactions to the baseline film, $F(2, 70)=1.07$, $\eta^2_p=.03$, $p=.35$, or personal relevance of the baseline film $F(2, 70)=.87$, $\eta^2_p=.02$, $p=.43$. Means, standard deviations of these variables pre- and post- processing mode manipulation are shown in Table 6.

3.2.5. Correlations between baseline responses to film and PTSD outcomes

Pearson correlations between baseline responses to film variables and PTSD outcome measures were conducted, as shown in Table 4. Significant relationships were found between personal relevance of the baseline film and total number of intrusions (p<.01), personal relevance of the baseline film and number of image-based intrusions (p<.01), personal relevance of the baseline film and post IES-R (p<.001), baseline mood and post IES-R (p<.05), baseline distress and post IES-R (p<.05), and baseline activation and post IES-R (p<.05).

Table 4. Pearson correlations between responses to baseline film (pre-processing mode manipulation) and PTSD outcomes

	Total intrusions		**Thought intrusions**		**Image intrusions**		**Affect intrusions**		**PTSD (post IES-R)**	
	r	***p***	***r***	***p***	***r***	***p***	***r***	***p***	***r***	***p***
Baseline mood	-.15	.20	-.12	.33	-.07	.58	-.20	.09	-.26*	.03
Baseline horror	.20	.08	.06	.63	.22	.06	.07	.56	.19	.10
Baseline distress	.20	.09	.08	.52	.19	.10	.18	.13	.25*	.03
Baseline activation	.18	.13	.16	.19	.10	.40	.07	.554	.25*	.03
Baseline personal relevance	.31**	<.01	.15	.20	.30**	<.01	.07	.58	.416***	<.001

*Significant at the α = .05 level, **Significant at the α = .01 level, ***Significant at the α = .001 level

3.2.6. Summary: Group comparisons

As can be expected with random assignment, between groups comparisons revealed that the three groups did not differ on key demographic variables, baseline questionnaires, ratings of mood, distress, horror, activation or personal relevance in relation to the pre-training baseline film. Significant correlations were found between some of the baseline measures and the PTSD outcome variables. Where baseline measures were significantly correlated with primary outcomes, they were treated as covariates in the relevant analyses.

3.3. Manipulation checks

Table 5 compares means and standard deviations of manipulation checks between groups. There were no significant differences between self-reported attention to the final film, adherence to group instructions or self-reported compliance with the intrusion diary between groups. All participants reported paying attention to the final film (>50% of the time) and complying with their allocated mode of processing (>50% of the time). The majority of participants complied with the intrusion diary 100% of the time, with a small proportion of participants in each group showing less than perfect adherence.

Table 5. Means, standard deviations and ANOVAs of manipulation checks by group

		Total sample (N = 73) *M (SD) or N (%)*	**Abstract (n = 26)** *M (SD) or N (%)*	**Concrete (n = 26)** *M (SD) or N (%)*	**Control (n = 21)** *M (SD) or N (%)*	**Statistics**
Attention to test film		7.47(1.25)	7.54(1.27)	7.58(1.27)	7.24(1.22)	$F(2, 70)=.49$, $\eta^2_p=.01$, $p=.62$
Adherence to processing mode instructions		4.55(2.54)	4.27(2.46)	4.00(2.51)	5.57(2.48)	$F(2, 70)=2.58$, $\eta^2_p=.07$, $p=.08$
Intrusion diary compliance	100%	53(72.6%)	20(76.9%)	21(80.8%)	12(57.1%)	$\chi^2(2,73)=3.64$, $v=.22$, $p=.16$
	<100%	20(27.4%)	6 (23.1%)	5 (19.2%)	9 (42.9%)	

3.4. Changes in mood, emotional response and personal relevance over time

In order to assess potential changes in mood, emotional reactivity and personal relevance of the film clips over the course of the processing mode manipulation, five 2 (time: pre- vs. post- processing mode manipulation) x 3 (condition: abstract vs. concrete vs. control) mixed model ANOVAs were conducted. These results of these analyses are summarised in Table 6.

3.4.1. Mood

There was a significant main effect of time on mood, with all groups reporting a decrease in mood from pre- to post-processing mode manipulation. There was no main effect of condition on mood, and no significant interaction between condition and change in mood over time.

3.4.2. Horror

There was a significant main effect of time on horror, with all groups reporting an increase in horror from pre- to post-processing mode manipulation. There was no main effect of condition on horror, but a significant interaction between condition and horror over time emerged. The interaction suggests that both the abstract and concrete groups showed greater increases in ratings of horror during the experiment than the control group.

3.4.3. Distress

There was a significant main effect of time on distress, with all groups reporting an increase in distress from pre- to post-processing mode manipulation. There was no main effect of condition on distress, and no significant interaction between condition and change in distress over time.

3.4.4. Activation

There was a significant main effect of time on activation, with all groups reporting an increase in activation from pre- to post-processing mode manipulation. There

was no main effect of condition on activation, and no significant interaction between condition and change in activation over time.

3.4.5. Personal relevance

There was a significant main effect of time on personal relevance, with all groups rating the test film as having more personal relevance than the baseline film. There was no main effect of condition on personal relevance, and no significant interaction between condition and personal relevance over time.

3.4.6. Summary: Changes over time

Changes in mood, emotional reactivity and personal relevance of the film clips over the course of the processing mode manipulation were compared between groups. This revealed that all groups reported a decrease in mood, an increase in distress, an increase in activation and an increase in horror from pre- to post- processing mode manipulation, with the effect of horror over time being more marked in the abstract and concrete groups. This may have been because there was a trend for the control group to have greater horror reactions to the baseline film than the other two groups, (p = .08) which meant that their increase in horror over time would be less. All groups showed a comparable increase in the degree to which they found the test film (post-processing mode manipulation) more personally relevant than the baseline film (pre-processing mode manipulation).

Table 6. Effects of the processing mode manipulation on mood, emotional reactivity to and personal relevance of the film clips

	Condition			ANOVA								
				Time			Condition			Time x Condition		
	Abstract (n = 26) *M (SD)*	Concrete (n = 26) *M (SD)*	Control (n = 21) *M (SD)*	*F*	η^2_p	*p*	*F*	η^2_p	*p*	*F*	η^2_p	*p*
Mood												
Pre-processing mode manipulation	7.54 (1.27)	7.58 (1.27)	7.24 (1.22)	263.96***	.79	<.001	.34	.01	.71	1.46	.04	.24
Post-processing mode manipulation	4.04 (1.99)	4.58 (1.47)	4.52 (1.69)									
Horror												
Pre-processing mode manipulation	4.27 (2.46)	4.00 (2.51)	5.57 (2.48)	16.65***	.19	<.001	.64	.02	.53	3.93*	.10	.02
Post-processing mode manipulation	6.19 (2.56)	5.69 (2.54)	5.57 (2.64)									
Distress												
Pre-processing mode manipulation	4.69 (2.15)	3.96 (2.01)	5.43 (2.14)	33.19***	.32	<.001	1.14	.03	.33	1.92	.05	.15
Post-processing mode manipulation	6.31 (2.28)	6.04 (2.07)	6.24 (2.64)									
Activation												
Pre-processing mode manipulation	4.81 (2.06)	4.04 (1.82)	4.52 (1.83)	45.28***	.39	<.001	.57	.02	.57	.53	.02	.59
Post-processing mode manipulation	6.15 (2.07)	5.96 (1.69)	6.07 (1.93)									
Personal relevance												
Pre-processing mode manipulation	2.42(2.34)	1.62 (2.16)	2.24 (2.45)	10.90**	.14	.002	1.71	.05	.19	1.92	.05	.16
Post-processing mode manipulation	2.81 (2.59)	2.54 (2.49)	4.24 (3.39)									

*Significant at the α = .05 level, **Significant at the α = .01 level, ***Significant at the α = .001 level

3.5. Main analysis of research hypotheses

Table 7 displays the means and standard deviations of the main PTSD outcomes by group: total number of intrusions, type of intrusions, and total post- manipulation IES-R scores. One-way ANOVAs or ANCOVAs with 3 levels (condition: abstract vs. concrete vs. control) were conducted to investigate differences in the total number of intrusions, type of intrusions and associated PTSD symptoms (post IES-R) participants reported one week after the processing mode manipulation. Post-hoc analyses were conducted using Fisher's LSD tests.

Table 7. Means and standard deviations of PTSD outcomes by group

PTSD outcomes		**Abstract** ***(n = 26)*** ***M (SD)***	**Concrete** ***(n = 26)*** ***M (SD)***	**Control** ***(n = 21)*** ***M (SD)***
Intrusions	*Total*	5.58 (4.43)	3.77 (4.45)	4.90 (3.89)
	Image-based intrusions	2.58 (2.35)	2.54 (3.91)	2.33 (1.88)
	Thought-based intrusions	2.58 (2.98)	0.88 (1.28)	2.00 (2.61)
	Affect-based intrusions	0.35 (0.63)	0.31 (0.55)	0.52 (0.87)
Post- IES-R	*Total*	13.0 (8.07)	9.81 (12.03)	13.19 (11.21)

3.5.1. Intrusive memories

Controlling for personal relevance of the baseline film, ANCOVAs revealed no significant main effect of condition on total number of intrusions ($F(2, 69) = 1.47$, $p = .24$, $\eta^2_p = .04$) or on number of image-based intrusions, ($F(2, 69) = .35$, $p = .71$, $\eta^2_p = .01$). There was also no main effect of condition on affect-based intrusions ($F(2, 70) = .42$, $p = .66$, $\eta^2_p = .01$).

However, there was a significant main effect of condition on thought-based intrusions, ($F(2, 42.34) = 3.76$, $p = .03$, $\eta^2_p = .08$)[2]. Post-hoc analysis of the significant main effect of condition on thought-based intrusions using Fisher's LSD test revealed the abstract group experienced significantly more intrusive thoughts than the concrete group ($p = .01$). However, no significant differences were found

[2] For the thought-based intrusions variable, Levene's test of homogeneity of variance was significant ($p = .03$), and therefore Welch's F-ratio is reported.

between the number of thought-based intrusions in the concrete and control groups (p = .16) or between the abstract and control groups (p = .35). These results are displayed visually in Figure 3.

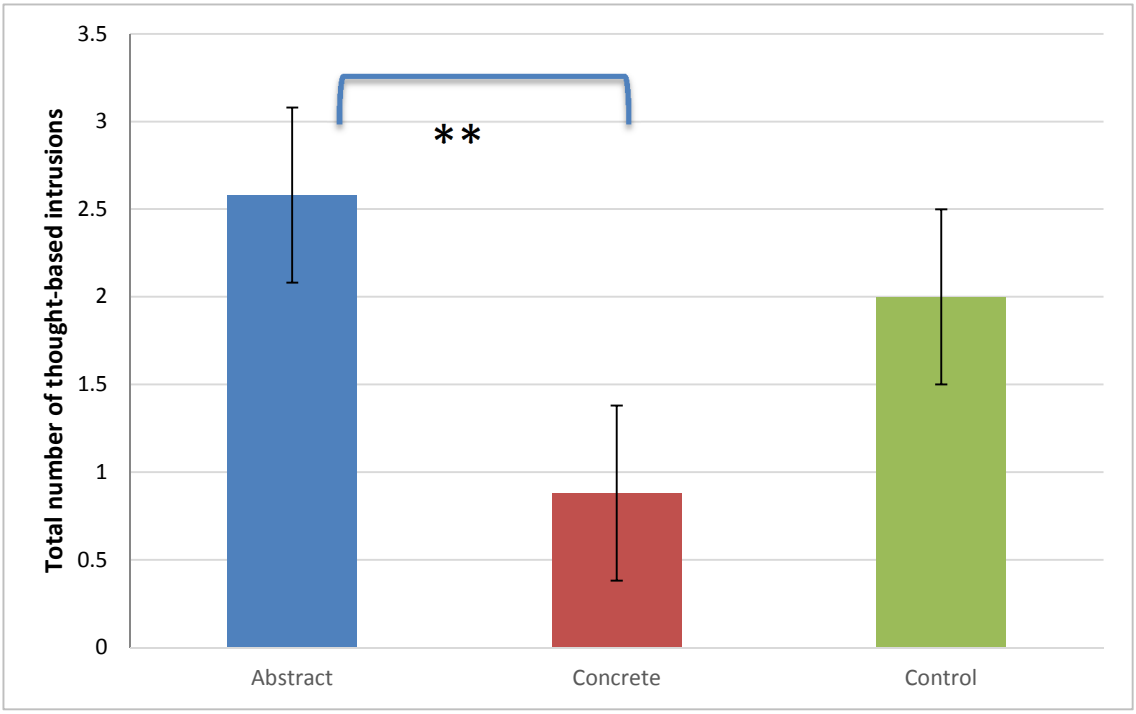

Figure 3. Total number of thought-based intrusions by group (means and standard errors are shown) **Significant at the α = .01 level

3.5.2. PTSD symptoms (post- IES-R)

Controlling for the significant correlates of outcome, ANCOVA revealed a significant main effect of condition on post- IES-R symptoms ($F(2, 59) = 3.12$, p = .05, $\eta^2_p = .10$). Post hoc analysis using Fisher's LSD test revealed significant differences between the abstract and concrete group (p = .03), with the concrete group experiencing significantly fewer PTSD symptoms as measured by the post-IES-R than the abstract group, and also a significant difference between the concrete and control group (p = .05), with the concrete group experiencing significantly fewer PTSD symptoms than the control group. The difference between the abstract and the control groups was not significant (p = .98). These results are displayed visually in Figure 4.

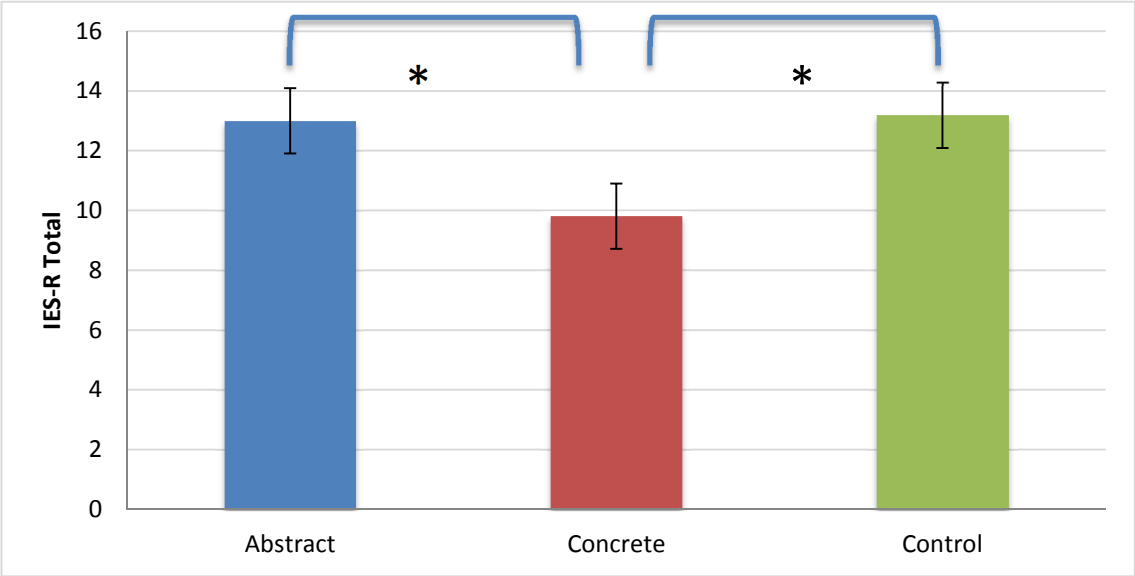

Figure 4. Post- IES-R total by group (means and standard errors are shown)
* Significant at the α = .05 level.

3.5.3. Summary: Intrusive memories and PTSD symptoms

Intrusive memories

Contrary to prediction, there was no main effect of condition on the total number of intrusive memories. However, in relation to the exploratory questions, there was a significant main effect of condition on the number of thought-based intrusions with the concrete group having significantly fewer than the abstract group at one week follow-up. There were no differences between any of the groups on the number of image or affect-based intrusions.

PTSD symptoms

In line with prediction, training in concrete processing led to significantly fewer PTSD symptoms compared with training in abstract processing at one-week follow-up. In relation to our exploratory questions, training in concrete processing also led to significantly fewer PTSD symptoms compared with natural processing. There were no differences between abstract and natural processing in relation to PTSD symptoms.

3.5.4. Trauma memory

Table 8 displays the means and standard deviations of the memory outcomes: total number of recognition memory questions correct, recognition accuracy (hits-false positives), and free-recall incoherence score by group. One-way ANOVAs with 3 levels (condition: abstract vs. concrete vs. control) were conducted to investigate differences between groups in recognition memory, recognition accuracy and trauma-recall incoherence scores for the trauma films one week after exposure. Post hoc analyses were conducted using Fisher's LSD tests.

Table 8. Means and standard deviations of memory outcomes by group

Memory outcomes	**Abstract** ***(n = 26)*** ***M (SD)***	**Concrete** ***(n = 26)*** ***M (SD)***	**Control** ***(n = 21)*** ***M (SD)***
Total number of recognition memory questions correct	19.04 (2.46)	21.23 (1.75)	18.71 (2.13)
Recognition accuracy (hits – false positives)	14.35 (0.69)	17.08 (0.54)	13.71 (0.71)
Trauma-recall incoherence score	1.50 (1.14)	0.69 (1.01)	1.19 (1.29)

ANOVAs revealed a significant main effect of condition on the total number of items correct on the memory test, ($F(2, 70) = 10.20$, $p<.001$, $\eta^2_p = .23$), a significant main effect of condition on the memory test recognition accuracy, ($F(2, 70) = 7.70$, $p = .001$, $\eta^2_p = .18$) and a significant main effect of condition on trauma-recall incoherence score, ($F(2, 70) = 3.65$, $p = .03$, $\eta^2_p = .09$).

In line with the primary hypotheses, post hoc analysis revealed that training in concrete processing led to more correctly remembered items on the memory test than training in abstract processing ($p<.001$). In relation to the exploratory questions, training in concrete processing also led to more items correctly remembered than natural processing ($p<.001$). The difference between the abstract and the control groups in relation to the number of memory items correctly remembered was not significant ($p =.61$).

Similarly, in line with prediction, training in concrete processing led to better recognition accuracy for items on the recognition memory test than training in abstract processing (p = .003). In relation to the exploratory questions, training in concrete processing also led to better recognition accuracy than natural processing (p < .001). The difference between the abstract and the control groups in relation to recognition accuracy was not significant (p = .50).

Again, in support of the primary hypotheses, training in concrete processing led to a more coherent trauma-recall narrative than training in abstract processing (p = .01). There were no differences between the incoherence of the trauma-recall narratives in the concrete and control groups (p = .18) or the abstract and control groups (p = .23).

3.5.5. Summary: Trauma memory

In line with predictions, training in concrete processing led to better recognition memory (in terms of total number of items correctly remembered on the recognition memory test), better recognition accuracy (hits – false positives) and a more coherent trauma recall narrative compared with training in abstract processing.

In relation to our exploratory questions, training in concrete processing led to better recognition memory and better recognition accuracy for items on the recognition memory test than natural processing. However, there were no differences between training in concrete processing and natural processing in terms of trauma-recall narrative coherency, or between abstract and natural processing on any of the memory variables.

3.5.6. "Natural" processing analysis

Exploratory analyses were conducted to investigate what "natural" cognitive processing during exposure to analogue trauma consisted of. 35% (N = 58/168) of the control group's thoughts they were having whilst watching the films were analysed using thematic analysis. Thought narratives were taken from three of the films watched, namely the first training film, the 3rd training film and the final film. The content of the thought narratives were thematically coded by the author as reflecting either predominately abstract processing, concrete processing or a mixture of processing modes in line with Watkins' (2008) processing mode definitions. A psychologist colleague was provided with 25% of the sample (N= 15/58) and was trained to provide a consensus rating as to whether the narrative reflected either predominately abstract processing, concrete processing or a mixture of processing modes.

Results of the thematic analysis revealed that the majority of participants did not consistently adopt one processing mode, with 76% of control participants adopting a variety of processing modes across three of the films that they watched (e.g. a purely concrete/abstract mode in relation to one film and a mixed abstract and concrete processing mode in relation to another). Of the 58 control narratives coded, 7 narratives indicated a purely abstract processing mode was being adopted (12%), 14 indicated a purely concrete processing mode (24%) and 37 narratives indicated a mixture of both abstract and concrete modes (64%). Figure 5 summarises the results of the thematic analysis, illustrating the types of thoughts the control group were having in this sample. Examples of coded narratives are also provided.

Figure 5. A visual display of the types of thoughts the control group were having whilst watching the trauma films. **Blue circles represent concrete thoughts** and **red circles represent abstract thoughts**.

An example of a narrative coded as reflecting a purely **abstract processing** mode:

"*I thought a lot about what the friend might have been going through at that point* **[thoughts about the implications of the event on others]***/and how hard it must be for the emergency response workers to willingly expose themselves to such scenes on a daily basis* **[thoughts about the implications of the event on others]***/and*

the indignity of the poor lady's situation **[thoughts about the implications of the event on others]**.*"*

An example of a narrative coded as reflecting a purely **concrete processing** mode:

"I was surprised they didn't shoot him **[comments on how they felt in relation to film]***/and that he wasn't wearing any trousers* **[comments on objective details]***/I guess that's understandable given his distress* **[rationalising thoughts]***/I jumped back when they fired the gun/I started to think about mechanics of shot/how accurate could they have been* **[comments on objective details]***/police turns and tells person to get out* **[thoughts about the events as they unfolded]***/I noticed a car in the background* **[comments on objective details]***/ people still going on with their lives despite man in middle of road* **[comments on objective details]**.*"*

An example of a narrative coded as reflecting a **mixture of processing** modes*:*

"I found it uncomfortable to hear her moaning **[comments on how they felt in relation to film]***/it sounded painful* **[comment on sounds]/***I was thinking the clinical team looked like they knew what they were doing* **[rationalising/hopeful thoughts]***/I thought about what if this happened to me* **[1st person perspective]**."

4. DISCUSSION

4.1. Summary of findings

As an expansion of White and Wild (under revision), the primary aim of the current study was to investigate whether training in abstract processing *during* exposure to analogue trauma is more harmful than training in concrete processing in terms of the development of intrusive memories (type and frequency), associated PTSD symptoms, and the accuracy and coherency of the trauma memory. In addition, the study aimed to extend the extant research in this area by exploring the relationship between concrete training and no training in the prevention of analogue PTSD, examining the effects of processing mode training on specific types of intrusive memories, as well as exploring the content of "natural" cognitive processing during exposure to analogue trauma.

The primary hypotheses were partially supported by the results of the study, as training in concrete processing during exposure to analogue trauma led to significantly fewer PTSD symptoms and significantly fewer thought-based intrusions than training in abstract processing at one week follow up, but no differences were found between conditions in the total number of intrusive memories. In addition, training in concrete processing also led to better recognition memory, better recognition accuracy and a more coherent trauma recall narrative compared with training in abstract processing. These findings indicate a partial replication and expansion of White and Wild (under revision) and therefore strengthen the hypothesis that training individuals to adopt a concrete mode of processing during to exposure to analogue trauma is less harmful than abstract training in the prevention of analogue PTSD symptoms. In this way, our study can be seen as a useful addition to the emerging evidence base showing that the mode of processing adopted in relation to a traumatic event has a direct effect on post-event PTSD symptoms (Ehring et al., 2008; Ehring, Szeimies, et al., 2009; Santa Maria et al., 2012; Schaich et al., 2013).

In relation to the exploratory questions, we found significant differences between training in concrete processing and natural processing in relation to PTSD symptoms as measured by the IES-R, recognition memory and recognition accuracy of the trauma memory. However no significant differences between the two groups in relation to total number of intrusions, or trauma-recall narrative coherency were found. These results provide preliminary evidence that adopting a concrete mode of processing during exposure to analogue trauma may be more protective against the development of PTSD symptoms, and may improve recognition memory accuracy for the trauma over and above natural processing. However, these results need to be interpreted with caution. As this was the first study to investigate "natural" processing style in relation to analogue trauma, these findings need to be replicated. In addition, the significant difference between the concrete and control group on recognition memory may simply be a reflection of the experimental instructions given to the concrete participants, who were instructed to pay attention to what they could see and hear in the films, which may have inherently biased their ability to score better on a forced choice recognition memory test that was based on visual details of the trauma. On the other hand, the

result may be an early indicator of the beneficial effects of concrete training in improving the integration of the memory for the trauma into autobiographical memory. In order to disentangle the effects of concrete processing on trauma memory, this should be explored in future research.

In relation to the effects of processing mode training on different types of intrusive memories, the results showed that training in abstract processing resulted in significantly more thought-based intrusions than training in concrete processing. No other differences were found between any of the other conditions on any other types of intrusive memories. Additional exploratory analyses included thematic analysis of a proportion of the types of thoughts the no training control group were having during exposure to the analogue trauma, in order to shed light on "natural" cognitive processing styles. These results suggested that natural cognitive processing typically consists of a mixture of abstract and concrete processing styles, and that in this sample, more than two-thirds of individuals did not consistently adopt one processing style when exposed to a variety of analogue traumas. However, as previously mentioned, caution must be taken before any firm conclusions are drawn with regards to these findings, and replications must be made.

Taken together, these results seem to suggest that concrete processing may be significantly better than abstract processing at preventing the development of analogue PTSD symptoms, but not intrusive memories per se. These results are therefore only partially in keeping with those of White and Wild (under revision), as they found training in concrete processing *during* exposure to analogue trauma to be significantly better than training in abstract processing at preventing the development of *both* intrusive memories and associated PTSD symptoms. One of the reasons for the discrepant findings may be due to the fact a modified, shorter version of the processing mode instructions used by White and Wild (under revision) were used in the present study. There is also preliminary evidence from the results of this study to suggest that concrete training may be significantly better than natural processing with regards to its protective effects against the

development of analogue PTSD symptoms, although it is unclear at present whether this extends to intrusive memories specifically.

The significant difference between the concrete and control groups with regards to the development of PTSD symptoms may also be partially explained by the results of the thematic analysis that shows that individuals tend to naturally appraise analogue trauma in a mixture of concrete and abstract modes. In this way, natural appraisals of analogue trauma may not be 'good enough' to prevent against the development of analogue PTSD symptoms as they contain elements of dysfunctional abstract processing amidst functional concrete processing. It seems to be that only when a purely concrete mode of processing is adopted that the functional effects of processing mode are seen. Taken together, these results suggest that a tendency towards peri-traumatic abstract appraisals of trauma could be considered a risk factor for PTSD development, and peri-traumatic concrete appraisals as a protective factor.

4.2. Theoretical implications

The maladaptive effects of abstract processing and the adaptive effects of concrete processing on PTSD symptoms can be explained on a theoretical level in relation to Ehlers and Clark's (2000) cognitive model of PTSD. As previously described, their model proposes that PTSD symptoms persist as a result of continued negative appraisals of the trauma and/or its sequelae and a disturbance in autobiographical memory of the event, which is poorly elaborated and contextualised. In this way, recovery from symptoms requires the elaboration and contextualisation of the trauma memory and the modification of excessively negative trauma-related appraisals. Abstract processing is hypothesised to interfere with both processes, whereas concrete processing facilitates them. The results of the study show partial support for this theory as training in abstract processing led to an increase in PTSD symptomatology, a more incoherent trauma narrative and poorer recognition memory for items related to the event in relation to concrete training. However, trauma-related appraisals were not evaluated in the present study, so it is unclear what effect abstract processing had on these.

In addition, Stöber's (1998) reduced concreteness theory of worry proposes that the abstract, verbal, nature of worry interferes with the emotional processing of the worry related material, as it perpetuates the avoidance of the emotional memory. Applying this theory to PTSD, it may be the case that abstract peri-traumatic cognitive processing acts as a cognitive avoidance that prevents successful emotional processing of the trauma memory in a similar way (Foa & Kozak, 1986). In contrast, concrete peri-traumatic cognitive processing may facilitate emotional processing by promoting the integration of the trauma with other autobiographical memories and thereby inhibit the cue-driven retrieval of intrusive memories. Again, our findings only provide partial support for this theory, as although the concrete group displayed fewer PTSD symptoms than the abstract group, we did not specifically measure trauma memory integration into autobiographical memory. However, the results of the exploratory analyses also partially support this theory, as the abstract group were found to have more thought-based intrusions (rather than images) in comparison to the concrete group. This result supports the idea that abstract peri-traumatic processing may be similar to worry in GAD in consisting of mainly verbal based thoughts, and therefore hinders emotional processing of the trauma-related material in a similar way.

4.3. Clinical and occupational implications

Although it remains to be seen whether the harmful effects of abstract processing generalise to survivors of real traumas, the findings hold potential clinical and occupational implications with regards to prevention and treatment of PTSD. Concreteness training has already been developed as a guided self-help treatment for rumination in depression, and has been shown to be efficacious in a proof-of-principle study (Watkins et al., 2009) and in an RCT in patients with major depression (Watkins et al., 2012). As proposed by Schaich et al. (2013), if the causal impact of concreteness training on protecting from PTSD symptoms is further confirmed in a trauma-exposed population, concreteness training could be offered as a preventative intervention to individuals most at-risk of developing PTSD. Indeed when Laposa and Alden (2006) interviewed emergency service workers about their most effective coping strategies, they found that these at-risk

groups had an inherent preference for concrete cognitive processing strategies, and when tested in an experimental paradigm, these were found to significantly protect against the development of intrusive memories. One example of a prevention programme that has already been developed for at-risk groups is the Attention Bias Modification Initiative currently being trialled amongst Israeli infantry soldiers prior to deployment to combat zones (Abend, Pine, & Bar-Haim, 2014; Wald et al., 2013). This example is encouraging evidence that prevention programmes for at-risk groups are indeed developed and implemented as a result of controlled experimental proof-of-principle studies.

In addition, there is preliminary evidence to suggest that excessive levels of rumination may impair the effects of evidence-based based PTSD treatment protocols (Echiverri et al., 2011). The use of strategies that specifically target dysfunctional rumination by changing the processing mode may be promising in trauma survivors with PTSD who show excessive levels of trauma-related rumination characterised by abstract appraisals.

4.4. Limitations

The findings of the current study need to be interpreted in light of its limitations. For ethical reasons, an analogue trauma paradigm was used to investigate the study hypotheses. Whilst it is acknowledged that results derived from analogue trauma studies are limited in their clinical application due to the differences in stressor-severity, self-reference and self-relevance in comparison to real-life traumatic events, there continues to be strong evidence for the validity of the paradigm (Holmes et al., 2004; Weidmann et al., 2009). For example, one recent study found that repeated media exposure to trauma was in fact associated with higher acute stress than direct exposure (Holman, Garfin, & Silver, 2014) which is evidence to support the continued use video/TV footage of real-life traumatic events to induce trauma related stress symptoms in experimental research designs. However, given the recent specification in DSM-V (American Psychiatric Association, 2013) that non-professional exposure to traumatic material through electronic media, television, movies, or pictures is not a sufficient traumatic stressor to warrant a PTSD diagnosis, it is important to replicate the results of the

current study in survivors of real-life trauma before any firm conclusions for this population can be drawn.

An additional concern with regards to analogue designs is the potential for demand characteristics in response to the processing mode manipulation. However, Clapp et al. (2015) suggest that the role of this type of experimental bias is limited, based on the failure of previous studies using analogue trauma film paradigms and processing mode instructions to detect widespread demand characteristics (e.g. Schartau et al., 2009). Although we are unable to rule out the possibility of demand characteristics in the abstract and concrete processing groups, evidence from the existing literature provides reasonable assurance that participant biases are unlikely to account for the observed effects.

It is also noteworthy that no main effect of training in abstract vs. concrete vs. no training on intrusive memories was found. Given the relatively modest sample size, it is possible that the study was underpowered. Future research comparing abstract, concrete and control manipulations could ensure a larger sample size, thereby increasing the power to detect medium effects and reducing the risk of both type I (false positive) and type II (false negative) errors.

A related concern is the fact that some of the statistical analyses in the present study involved multiple tests of the same hypotheses. This may have inadvertently increased our risk of type 1 errors. It is possible that had a statistical correction been applied to control for multiple testing (e.g. Bonferroni's correction) the results may have differed.

A thematic processing mode coding system was devised for the purposes of this experiment to rate the content of participants' natural processing in the control group. Although a consensus rating was sought in the use of this measure, the extent to which the scoring system provides an accurate representation of the control participant's cognitive processing style needs further investigation. Further efforts to validate this scoring method through experimental research as

well as further attempts to elucidate the default cognitive processes of untrained individuals would improve the strength of our conclusions. In relation to this, the fact that some of the trauma films comprised of several scenes from the aftermath of different RTAs may have caused some participants to take the perspective of onlookers instead of that of a trauma survivor, as noted by Zetsche et al. (2009) in their study. The content of the control group's thoughts might therefore more closely reflect the cognitive processes in witnesses of traumatic situations than those of individuals directly involved.

Additional limitations include the recruitment processes and the failure to control for prior familiarity with traumatic media footage. First, participants were self-selected, and due to ethical transparency, participants were given clear information about the potentially distressing nature of the films prior to volunteering. Second, we did not control for number of hours participants spent watching medical TV, playing violent video games or watching horror films as has been controlled for in similar studies (Zetsche et al., 2009). It may have been the case that those who are typically distressed by such footage opted not to participate, and those who are more used to traumatic media were more likely to participate. In this way, the final sample may have consisted of individuals who are less distressed by traumatic footage than those in the average population, and speculatively this may have had some bearing on the subsequent development of intrusive memories. Future studies using the trauma film paradigm should explore the role of these factors in intrusion memory development.

4.5. Conclusions

Limitations notwithstanding, the results of the present study are promising since they provide more evidence that the processing mode hypothesis can be appropriately applied to PTSD. The study has partially replicated the finding from White and Wild (under revision) that training individuals to adopt a concrete mode of processing during to exposure to analogue-trauma is less harmful than abstract processing in preventing the development of PTSD symptomatology, but also provided new evidence that training in concrete processing is superior to abstract processing in preventing against the development of thought-based

intrusions, and in producing a more accurate and coherent memory for the trauma. Additionally, to the authors' knowledge, this is the first study to investigate the relationship between peri-traumatic concrete processing and "natural" cognitive processing, and provides preliminary support that training in concrete processing may provide protective effects against PTSD development over and above natural cognitive processing.

Whilst there were no differences in the total number of intrusive memories that developed between conditions, our results give clear indications that concrete processing is superior to abstract processing in terms of protecting against the development of PTSD symptoms, thought-based intrusions, and promoting a more coherent and accurate memory of the analogue trauma. Since individuals may naturally adopt a mixture of abstract and concrete processing styles when attending to trauma and given the strength of findings linked to concrete processing, it may be beneficial to train individuals to adopt a concrete processing mode peri-traumatically as a protective measure. Before such prevention programmes are developed, future research should test whether the results can be replicated amongst trauma survivors as well as continue to examine the content and effects of natural cognitive processing during exposure to trauma.

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6. APPENDICES

Letter of ethical approval

Claudia Hallett
Department of Clinical Psychology
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19 February 2014

Dear Claudia,

PNM/13/14-61 An experimental analogue study to investigate the role of peri-traumatic cognitive processing on post-event intrusions and recognition memory

Review Outcome: Full Approval

Thank you for sending in the amendments/clarifications requested to the above project. I am pleased to inform you that these meet the requirements of the PNM RESC and therefore that full approval is now granted.

Please ensure that you follow all relevant guidance as laid out in the King's College London Guidelines on Good Practice in Academic Research (http://www.kcl.ac.uk/college/policyzone/index.php?id=247).

For your information ethical approval is granted until 19 February 2017. If you need approval beyond this point you will need to apply for an extension to approval at least two weeks prior to this explaining why the extension is needed, (please note however that a full re-application will not be necessary unless the protocol has changed). You should also note that if your approval is for one year, you will not be sent a reminder when it is due to lapse.

Ethical approval is required to cover the duration of the research study, up to the conclusion of the research. The conclusion of the research is defined as the final date or event detailed in the study description section of your approved application form (usually the end of data collection when all work with human participants will have been completed), not the completion of data analysis or publication of the results. For projects that only involve the further analysis of pre-existing data, approval must cover any period during which the researcher will be accessing or evaluating individual sensitive and/or un-anonymised records. Note that after the point at which ethical approval for your study is no longer required due to the study being complete (as per the above definitions), you will still need to ensure all research data/records management and storage procedures agreed to as part of your application are adhered to and carried out accordingly.

If you do not start the project within three months of this letter please contact the Research Ethics Office.

Should you wish to make a modification to the project or request an extension to approval you will

need approval for this and should follow the guidance relating to modifying approved applications: http://www.kcl.ac.uk/innovation/research/support/ethics/applications/modifications.aspx
The circumstances where modification requests are required include the addition/removal of participant groups, additions/removal/changes to research methods, asking for additional data from participants, extensions to the ethical approval period. Any proposed modifications should only be carried out once full approval for the modification request has been granted.

Any unforeseen ethical problems arising during the course of the project should be reported to the approving committee/panel. In the event of an untoward event or an adverse reaction a full report must be made to the Chair of the approving committee/review panel within one week of the incident.

Please would you also note that we may, for the purposes of audit, contact you from time to time to ascertain the status of your research.

If you have any query about any aspect of this ethical approval, please contact your panel/committee administrator in the first instance (http://www.kcl.ac.uk/innovation/research/support/ethics/contact.aspx). We wish you every success with this work.

Yours sincerely,

James Patterson – Senior Research Ethics Officer

Cc: Jennifer Wild

INFORMATION SHEET FOR MAIN STUDY PARTICIPANTS

REC Reference Number: PNM/13/14-61

Version 1 25.11.13

What influences reactions to trauma? A trauma film study

We would like to invite you to participate in this Doctorate in Clinical Psychology research project. You should only participate if you want to; choosing not to take part will not disadvantage you in any way. Before you decide whether you want to take part, it is important for you to understand why the research is being done and what your participation will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please ask the researcher if there is anything that is not clear or if you would like more information.

What is the purpose of this study?

This research aims to investigate what influences different emotional responses to traumatic films. Understanding different responses to traumatic material could help inform the development of prevention programmes for people who are regularly exposed to trauma (e.g. military personnel and emergency service works) and who at high risk of developing Post Traumatic Stress Disorder (PTSD) – a severe stress reaction that can develop after exposure to traumatic events such as violence, road traffic accidents, terrorist bombings and natural disasters.

Am I eligible?

You will be invited to take part if you are over the age of 18, fluent in English, and if the first two questionnaires you complete suggest that you have few signs of depression or PTSD. You will not be able to take part if either of these questionnaires suggests that you may have depression or PTSD. If this is the case, the researcher will talk with you and give you suggestions about what may be helpful. This could be a visit to your GP. These screening questionnaires will be destroyed after use. You will also not be able to take part if you are a medical student or medical professional.

What will taking part involve?

Participating in this study will involve attending a testing session at the Institute of Psychiatry, which will last for approximately an hour and a half, completing a simple online diary over the following week, and completing a few online questionnaires at the end of the following week. Therefore the total time commitment required for this study is one week. During the testing session, you will be asked to watch a series of film clips that contain traumatic material (e.g. road traffic accidents, humans and animals in distress) and you will be instructed as to how to watch them. You will be asked to fill in some brief questionnaires at various points during the session. After completion of the online diary and the online questionnaires you will receive a payment of £15 as compensation for your time.

What are the possible disadvantages or risks of taking part?

As this study involves watching films that contain traumatic material, there is a risk that some people may become distressed. Furthermore, some of the questionnaires ask about sensitive topics, such as previous exposure and reactions to trauma, which some participants could find distressing. However, studies of a similar nature have been conducted before without adverse consequences and any distress that you may

experience is likely to be short-lived. You are free to withdraw at any time, without giving a reason, and in the unlikely event that you do become distressed, the session would be stopped immediately. You would also be given the opportunity to talk the researcher, who is a Clinical Psychologist in training about your distress. The researcher's supervisor who is a Consultant Clinical Psychologist will also be available to contact during the testing sessions if needed

What are the possible benefits of taking part?

If you take part you will receive £15 as compensation for your time and will be sent a summary of the research findings. Taking part will also give you the opportunity to be involved in research which seeks to promote greater understanding of responses to trauma and inform preventative interventions for people who are regularly exposed to it. When the study is completed we intend to publish the results in a peer-reviewed journal (information available on request), but your information would be completely confidential and you would not be named in the paper.

Will my taking part in the study be kept confidential?

All information and data collected will be anonymised and confidential in accordance with the Data Protection Act (1998). You will be randomly allocated a unique code, which will be recorded on questionnaires and used in data analysis so that you cannot be identified from the data. Anything containing personally identifiable information, such as signed consent forms, will be kept separately from the data in a locked filing cabinet and only the immediate research team (which includes the researcher and her two supervisors) will have access to it. Electronic data will be kept on a secure database on a password accessible computer and any paper forms will be kept in a locked filing cabinet. All personally identifiable information will be kept for up to 12 years, and then will be confidentially destroyed. We will keep a completely anonymised copy of the database indefinitely, from which you will not be able to be identified. The only circumstance under which confidentiality cannot be maintained is if you indicated potential risk of harm to yourself or other people.

What do I do if I want to take part?

If you would like to take part in this study or require further information about it, then please contact the researcher using the following details:

Claudia Hallett, Clinical Psychologist in Training, Addiction Sciences Building, Institute of Psychiatry, 4 Windsor Walk, London, SE5 8AF. Email: **Claudia.Hallett@kcl.ac.uk, Tel: 0207 848 0223/4.**

It is entirely up to you to decide whether or not to take part in the study. If you do decide to take part you will be given this information sheet to keep and will then be asked to sign a consent form. Even if you do decide to take part you will still be free to withdraw from the study at any time and without giving a reason. You will also be able to withdraw your data up until 31st December 2014.

If this study has harmed you in any way, you can contact King's College London using the details below for further advice and information:

Dr Jennifer Wild, (Research Clinical Psychologist, Honorary Consultant Clinical Psychologist and Senior Lecturer), Department of Psychology, Henry Wellcome Building, De Crespigny Park, London, SE5 8AF. Email: **Jennifer.Wild@kcl.ac.uk, Tel: 0207 848 5032**

CONSENT FORM FOR PARTICIPANTS IN RESEARCH STUDIES

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Title of Study: What influences reactions to trauma? A trauma film study

King's College Research Ethics Committee Ref: PNM/13/14-61

Thank you for considering taking part in this research. The person organising the research must explain the project to you before you agree to take part. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

- I confirm that I have read the accompanying Information sheet for this study (**Version 1, 25.11.13**), have had the opportunity to consider the information and to ask questions.

- I understand that if I decide at any time during the research that I no longer wish to participate in this project, I can notify the researchers involved and withdraw from it immediately without giving any reason. Furthermore, I understand that I will be able to withdraw my data up until the 31st December 2014.

- I consent to the processing of my personal information for the purposes explained to me. I understand that such information will be handled in accordance with the terms of the UK Data Protection Act 1998.

- I agree that the research team may use my data for future research and understand that any such use of identifiable data would be reviewed and approved by a research ethics committee
  (In such cases, as with this project, data would not be identifiable in any report).

- I agree to take part in the above project

The information you have submitted will be published as a report and you will be sent a copy. Please note that confidentiality and anonymity will be maintained and it will not be possible to identify you from any publications.

Participant's Statement:

I _____agree that the research project named above has been explained to me to my satisfaction and I agree to take part in the study. I have read both the notes written above and the Information Sheet about the project, and understand what the research study involves.

Signed: **Date:**

Investigator's Statement:

I _____confirm that I have carefully explained the nature, demands and any foreseeable risks (where applicable) of the proposed research to the participant.

Signed: **Date:**

Trauma screener

Many people have lived through or witnessed a very stressful and traumatic event at some point in their lives. Indicate whether or not you have experienced each traumatic event listed below by marking **Y** for Yes or **N** for No.

				If YES, did you experience distressing unwanted memories of the event (flashbacks, nightmares, unwanted thoughts?)	
1.	Serious traffic accident, (e.g., car, bike, train, or boating accident)	Y	N	Y	N
2.	Serious other accident, fire, or explosion (for example, accident at work, fire at home)	Y	N	Y	N
3.	Natural disaster (for example, tornado, hurricane, flood, or major earthquake)	Y	N	Y	N
4.	Non-sexual assault (for example, being mugged, physically attacked, shot, stabbed, or held at gunpoint)	Y	N	Y	N
5.	Seriously injuring or killing someone else	Y	N	Y	N
6.	Sexual assault (for example, rape or attempted rape)	Y	N	Y	N
7.	Military combat or a war zone *Please indicate whether you were:* *civilian* _____ / *military personnel* _____	Y	N	Y	N
8.	Terrorist attack (e.g., bombing)	Y	N	Y	N
9.	Unwanted sexual contact when you were younger than 18 with someone who was 5 or more years older than you (for example, contact with genitals, breasts)	Y	N	Y	N
10.	Imprisonment (for example, prisoner of war, hostage)	Y	N	Y	N
11.	Torture	Y	N	Y	N
12.	Life-threatening illness	Y	N	Y	N
13.	Witnessing others die / being seriously hurt	Y	N	Y	N
14.	Sudden, traumatic death of significant other	Y	N	Y	N
15.	Life-threatening illness of significant other	Y	N	Y	N
16	Other traumatic event				

Please specify:.....

.....

Impact of Events Scale-Revised (IES-R)

The following is a list of difficulties people sometimes have after stressful life events. Please read each item, and then indicate how distressing each difficulty has been for you **DURING THE PAST 7 DAYS** with respect to the traumatic event that you have experienced. How much were you distressed or bothered by these difficulties?

		Not at all	A little bit	Moderately	Quite a bit	Extremely
1.	Any reminder brought back feelings about it.	0	1	2	3	4
2.	I had trouble staying asleep.	0	1	2	3	4
3.	Other things kept making me think about it.	0	1	2	3	4
4.	I felt irritable and angry.	0	1	2	3	4
5.	I avoided letting myself get upset when I thought about it or was reminded of it.	0	1	2	3	4
6.	I thought about it when I didn't mean to.	0	1	2	3	4
7.	I felt as if it hadn't happened or wasn't real.	0	1	2	3	4
8.	I stayed away from reminders about it.	0	1	2	3	4
9.	Pictures about it popped into my mind.	0	1	2	3	4
10.	I was jumpy and easily startled.	0	1	2	3	4
11.	I tried not to think about it.	0	1	2	3	4
12.	I was aware that I still had a lot of feelings about it, but I didn't deal with them.	0	1	2	3	4
13.	My feelings about it were kind of numb.	0	1	2	3	4
14.	I found myself acting or feeling like I was back at that time.	0	1	2	3	4
15.	I had trouble falling asleep.	0	1	2	3	4
16.	I had waves of strong feelings about it.	0	1	2	3	4
17.	I tried to remove it from my memory.	0	1	2	3	4
18.	I had trouble concentrating.	0	1	2	3	4
19.	Reminders of it caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart.	0	1	2	3	4
20.	I had dreams about it.	0	1	2	3	4
21.	I felt watchful and on guard.	0	1	2	3	4
22.	I tried not to talk about it.	0	1	2	3	4

Patient Health Questionnaire (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems?		Not at all	Several days	More than half the days	Nearly every day
1	Little interest or pleasure in doing things	0	1	2	3
2	Feeling down, depressed, or hopeless	0	1	2	3
3	Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4	Feeling tired or having little energy	0	1	2	3
5	Poor appetite or overeating	0	1	2	3
6	Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7	Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8	Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9	Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3
		PHQ9 total score			☐

General Information Questionnaire

Please give us some background information about yourself. The following questions ask about you and your life in general. For each question, either write the answer on the line or tick the box which most applies to you. Some questions may have more than one answer.

1. Date of birth	_____/_____/_____
2. Gender	❑ Male ❑ Female
3. Ethnic background	❑ White ❑ Black/African/Caribbean/Black British ❑ Mixed/Multiple Ethnic Groups ❑ Other Ethnic Group _____ ❑ Asian/Asian British
4. Is English your first language?	❑ Yes ❑ No. Which is your first language? _____
5. What is your marital status?	❑ Single ❑ Divorced/Separated ❑ Married/Long-term partner ❑ Widowed
6. Are you	❑ Employed full-time ❑ Full-time student ❑ Employed part-time ❑ Part-time student ❑ Self-employed ❑ Unemployed ❑ A homemaker ❑ On disability ❑ On sick leave ❑ Retired ❑ Other: _____
7. What is your job/ course? (If unemployed/ retired: What was your last job?)	_____
8. How many years of formal education have you had?	_____years
9. Please mark any qualifications you have.	❑ No exams ❑ Degree ❑ Other: _____ ❑ GCSE/O Levels/GNVQ ❑ Postgraduate degree: please circle: Masters / PhD / other:_____ ❑ A Levels/NVQ ❑ Vocational degree
10. How often do you drive a car	❑ Everyday ❑ Once a week ❑ Twice a month ❑ Twice a year ❑ Never

State Trait Anxiety Inventory – Trait version (STAI-T)

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate option to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

	Almost never (0)	Sometimes (1)	Often (2)	Almost always (3)
1. I feel pleasant	☐	☐	☐	☐
2. I feel nervous and restless	☐	☐	☐	☐
3. I feel satisfied with myself	☐	☐	☐	☐
4. I wish I could be as happy as others seem to be	☐	☐	☐	☐
5. I feel like a failure	☐	☐	☐	☐
6. I feel rested	☐	☐	☐	☐
7. “I am calm, cool, and collected”	☐	☐	☐	☐
8. I feel that difficulties are piling up so that I cannot overcome them	☐	☐	☐	☐
9. I worry too much over something that doesn’t really matter	☐	☐	☐	☐
10. I am happy	☐	☐	☐	☐
11. I have disturbing thoughts	☐	☐	☐	☐
12. I lack self-confidence	☐	☐	☐	☐
13. I feel secure	☐	☐	☐	☐
14. I make decisions easily	☐	☐	☐	☐
15. I feel inadequate	☐	☐	☐	☐
16. I am content	☐	☐	☐	☐
17. Some unimportant thought runs through my mind and bothers me	☐	☐	☐	☐
18. I take disappointments so keenly that I can’t put them out of my mind	☐	☐	☐	☐
19. I am a steady person	☐	☐	☐	☐
20. I get in a state of tension or turmoil as I think over my recent concerns and interests	☐	☐	☐	☐

Perseverative Thinking Questionnaire (PTQ)

In this questionnaire, you will be asked to describe how you typically think about negative experiences or problems. Please read the following statements and rate the extent to which they apply to you when you think about negative experiences or problem

		Never	Rarely	Sometimes	Often	Almost always
1.	The same thoughts keep going through my mind again and again.	0	1	2	3	4
2.	Thoughts intrude into my mind.	0	1	2	3	4
3.	I can’t stop dwelling on them.	0	1	2	3	4
4.	I think about many problems without solving any of them.	0	1	2	3	4
5.	I can’t do anything else while thinking about my problems.	0	1	2	3	4
6.	My thoughts repeat themselves.	0	1	2	3	4
7.	Thoughts come to my mind without me wanting them to.	0	1	2	3	4
8.	I get stuck on certain issues and can’t move on.	0	1	2	3	4
9.	I keep asking myself questions without finding an answer.	0	1	2	3	4
10.	My thoughts prevent me from focusing on other things.	0	1	2	3	4
11.	I keep thinking about the same issue all the time.	0	1	2	3	4
12.	Thoughts just pop into my mind.	0	1	2	3	4
13.	I feel driven to continue dwelling on the same issue.	0	1	2	3	4
14.	My thoughts are not much help to me.	0	1	2	3	4
15.	My thoughts take up all my attention.	0	1	2	3	4

Trait Dissociation Questionnaire

Below are some experiences that people may have from time to time. We are interested in how often you have such experiences. Please read each statement carefully and circle the appropriate number, but do not spend too much time on each one. There are no right or wrong answers. We are interested in your personal experience.

		Never	Rarely	Some -times	Often	Mostly	Always
1.	I find myself doing things without knowing why.	0	1	2	3	4	5
2.	I feel as if other people live in a different world.	0	1	2	3	4	5
3.	I felt that my mind is divided.	0	1	2	3	4	5
4.	I can't understand why I got so cross and grouchy.	0	1	2	3	4	5
5.	I feel distant from my own emotions.	0	1	2	3	4	5
6.	I feel that my personality was split into distinct parts.	0	1	2	3	4	5
7.	I feel numb, unable to feel real emotions (such as love, happiness, or sadness).	0	1	2	3	4	5
8.	The world seems unreal or strange.	0	1	2	3	4	5
9.	I find writings, drawings, or notes among my belongings that I must have done, but couldn't remember doing.	0	1	2	3	4	5
10.	My moods can really change.	0	1	2	3	4	5
11.	Things seem to go by faster or slower than they really do.	0	1	2	3	4	5

Proneness to intrusions scales

Please circle the answer that best applies to you.

How often do you find that you have unwanted memories of unpleasant or stressful events popping into your mind, for example, after an exam, job interview or argument with somebody?

Not at all	Once a week or less	2-4 times per week	5 or more times per week	Everyday

How often do you find that after you have seen something unpleasant on the television or at the cinema, it comes back into your mind without you wanting it to?

Not at all	Once a week or less	2-4 times per week	5 or more times per week	Everyday

How often do you find that pleasant or happy events pop into your mind, for example, after a nice evening with friends or a film that you found funny?

Not at all	Once a week or less	2-4 times per week	5 or more times per week	Everyday

Intrusion Diary

Intrusive memories are spontaneously (not deliberately recalled) image-based memories or scenes from the films that may pop into your mind. They can take different forms, for example, seeing mental images or hearing sounds from the films, having bodily reactions/feelings like those during the films (e.g., being startled), or thoughts about the films.
INSTRUCTIONS:
First, record the date the intrusion occurred and then the time.
Next, for each intrusion please state whether it was an image, a thought, or a bodily sensation/feeling, and then provide a brief description of what it referred to.
Then please rate on a scale of 1-10 how distressing you found the memory to be.
Continue repeating this procedure for each intrusion you experienced. As soon as you have recorded each intrusion that you can recall, please scroll down to the bottom of the page and press 'submit'.
Alternatively, you may record intrusions separately, immediately after experiencing them. Simply make sure that you record your participant number, select the correct day on which they occur, fill out the relevant details and press submit. You can repeat this procedure over the course of the same day as often as you need to.

* Required

Participant number *
Please enter the participant number you were assigned

Intrusion No.1
Record the date and time of your first intrusion

dd/mm/yyyy --:--
Example: 03/05/2013 11:30 AM

What type of intrusion was it?
Please select one of the following options:

- An image
- A thought
- A bodily sensation/feeling

What did the intrusion refer to?
Please provide a description of what the intrusion referred to:

How distressing did you find the intrusion?
Please use the scale below to indicate how distressing you found the intrusive memory described above:

1 2 3 4 5 6 7 8 9 10

Not distressing at all ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ Extremely distressing

Memory tests for the films - Sections 1 and 2

We are interested to see what people can remember from the films one week after they've viewed them.

The first section asks you to record as much information as you can remember from the FINAL film you watched during the testing session.

The second section has a series of statements about all of the films you watched and asks you to rate them as TRUE/FALSE

Section 1

Please describe what you can remember from the FINAL film that you watched during the testing session? *

Please include as much detail as possible in the box below:

Section 2

Please rate the following statements as either TRUE/FALSE.
A brief description of each film is provided to help you.

Film 1

The first film was about a car crash that a couple and their grandson experienced.

Film 1: The woman's leg protruded from the blanket *

- ☐ True
- ☐ False

Film 1: The blanket covering the woman was blue *

- ☐ True
- ☐ False

Film 1: There was a large crowd of onlookers watching the rescue scene *

- ☐ True
- ☐ False

Film 1. Three men lifted the woman out of the wreckage *

- ○ True
- ○ False

Film 2

The second film was about an elderly man who took his own life.

Film 2. The policemen crouched behind their cars *

- [ ] True
- [ ] False

Film 2. The man was wearing brown trousers *

- [ ] True
- [ ] False

Film 2. The police shouted at the man to put his hands up *

- [ ] True
- [ ] False

Film 2. The police cars had the words 'highway patrol' written on them. *

- [ ] True
- [ ] False

Film 3

The third film was about 4 passengers in a multiple car pile up.

Film 3. The car carrying the passengers was gold in colour *

- [ ] True
- [ ] False

Film 3. The rescue worker used a chain saw to cut through the wreckage *

- [ ] True
- [ ] False

Film 3. There were doctors present at the scene *

- [ ] True
- [ ] False

Film 3. The rescue worker dropped one of the bodies as he lifted it into the coffin *

- [ ] True
- [ ] False

Film 4

The fourth film was about a bull fight in Spain.

Film 4. The bull was brown in colour *

- [ ] True
- [ ] False

Film 4. The bull attacked a child in the street *

- [ ] True
- [ ] False

Film 4. 6. Someone threw water at the bull *

- [ ] True
- [ ] False

Film 4. The woman the bull attacked was wearing jeans *

- [ ] True
- [ ] False

Film 5

The fifth film was about a multiple car and lorry pile up caused by a fog zone.

Film 5. There was red liquid on the surface of the road *

- [ ] True
- [ ] False

Film 5. There was blood on the windscreen of one of the cars *

- [ ] True
- [ ] False

Film 5. The woman's car was crushed between two lorries *

- [ ] True
- [ ] False

Film 5. The woman mouthed 'ouch' as she was lifted out of the wreckage

- [ ] True
- [ ] False

Film 6

The sixth film was about two fatal motorbike accidents.

Film 6. The motorbikes were blue and purple in colour *

- [ ] True
- [ ] False

Film 6. A white trainer could be seen amongst the wreckage *

- [ ] True
- [ ] False

Film 6. Chalk markings had been made on the ground *

- [ ] True
- [ ] False

Film 6. There was a children's toy in the car window *

- [ ] True
- [ ] False

Film 7

The seventh film was about September 11th.

Film 7. The man was wearing a white shirt *

- [ ] True
- [ ] False

Film 7. The man had removed his shoes *

- [ ] True
- [ ] False

Film 7. The man fell past an open window *

- [ ] True
- [ ] False

Film 7. The man tried to remove his shirt as he fell *

- [ ] True
- [ ] False

Film 8

The final film was about a young woman who had a serious accident.

Film 8. The emergency doctors wore yellow jackets *

- [ ] True
- [ ] False

Film 8. The medical procedure involved inserting a tube into the woman

- [ ] True
- [ ] False

Film 8. The woman was unconscious throughout the procedure *

- [ ] True
- [ ] False

Film 8. The doctors placed a bandage over her head *

- [ ] True
- [ ] False

DEBRIEFING SHEET FOR STUDY PARTICIPANTS
REC Reference Number: PNM/13/14-61

What influences reactions to trauma? A trauma film study

Background and aims of the study

This research aimed to investigate what influences different emotional responses to traumatic films. Evidence suggests that the mode in which traumatic events are processed may influence the development of PTSD, although experimental evidence is lacking. It is crucial to discover what could potentially protect against the development of symptoms such as intrusive memories, since this would allow for the development of evidence-based prevention programs for at-risk groups. Using a trauma film paradigm (Holmes & Bourne, 2008), the current study investigated the effect of processing mode training (abstract vs. concrete vs. no training) during exposure to an analogue trauma on the subsequent development of intrusive memories, the hallmark feature of PTSD.

The study was also interested in investigating the effect of processing mode on memory for the trauma one week later, as well as whether potential vulnerability factors (e.g. rumination, dissociation, self-reported proneness to intrusions) were related to the frequency of intrusions developed.

Which condition was I in?

You would have either been trained to view the traumatic films in an abstract or concrete mode, or received no training at all.

In the abstract condition, participants were trained to focus on the overall meaning and implications of the events and on questions such as 'Why?' and 'What if?'

In the concrete condition, participants were trained to focus on contextual details, the sequence of events and on questions such as 'What?' and 'How?'

In the no training condition, participants were not given any specific instructions as to how to watch the film – they were simply told to immerse their attention in the film and watch with their full attention on the film.

Psychological theory suggests that training people to adopt a concrete mode of processing during exposure to analogue trauma may protect against the development of intrusive memories. However, we do not yet know whether this is better than having no training and simply adopting a natural viewing mode. The results of the study will hopefully shed some light on this question.

More information?

If you have been affected by any of the material in the films and would like to discuss this further or would like further information about the study, then please contact the researcher using the following details:

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SERVICE EVALUATION PROJECT

The development, implementation and evaluation of a measurement feedback system for a youth mentoring service

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Commissioner of the evaluation: Iain Cassidy

(on behalf of the youth mentoring service)

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ABSTRACT

BACKGROUND: Measurement feedback systems (MFSs) are important service monitoring and development tools. Despite potential benefits, the implementation of MFSs into services tends to be met with resistance. Psychological theories of behaviour change can help us to understand barriers to initial uptake and sustained use. This report describes the development, implementation and evaluation of a MFS for the third sector organisation (TSO), "Friendship Works" (FW).

AIMS: The overall aim of the commission was to produce a MFS that FW could use as a quality indicator for their service. The aim of the evaluation was to assess the acceptability and feasibility of the MFS from the perspectives of FW stakeholders in a three-month implementation pilot.

METHOD: A MFS consisting of a portfolio of bespoke measures was produced for FW. A three-month pilot study was conducted in which the MFS was trialled in the service. Caseworker fidelity to the new system was measured quantitatively (as percentage adherence to the MFS during the pilot), and caseworker experience was assessed qualitatively through thematic analysis of a focus group discussion.

RESULTS: Although the overall completion rate of reviews and MFS forms was lower than expected, of the reviews that were completed, caseworkers showed high fidelity to the MFS (i.e. correct use of MFS at the appropriate review point). Qualitative data showed good face validity, feasibility and utility of the majority of the measures. Contextual issues were highlighted as the biggest barriers to successful integration of the new system.

CONCLUSIONS: This project acts as a case example regarding the feasibility of implementing a MFS into a small TSO. Implications for the consultancy role played by psychologists in these settings are discussed.

1. INTRODUCTION

1.1. What are measurement feedback systems (MFSs)?

Measurement feedback systems (MFSs) are systems that are developed and implemented into organisations for the purpose of systematically measuring the quality of service delivery. MFSs typically consist of standardized measures that provide objective data on service delivery. The regular provision of service data via MFSs can provide 'feedback' for the service about whether they are actually delivering the service they set out to deliver. For example, if the information gathered via the MFS suggests a discrepancy between the service aims and actual service user experience and/or outcomes, this information may prompt discussion and action on ways to improve the service. Additional intended benefits of MFSs include the provision of empirical evidence to illustrate service effectiveness to external audiences (e.g. commissioners), a means by which fidelity to the service delivery is measured and thereby ensured, as well as the provision of professional development opportunities through evaluation research (Bickman, 2008).

1.2. How are MFSs supposed to work?

There has been some theoretical research into the mechanisms of how MFSs might function best within a service. The Feedback Intervention Theory (FIT; Kluger & DeNisi, 1996) suggests that MFSs work by providing new information that redirects recipients' attention towards the details of a task. Evidence consistent with this theory can be seen in health care research whereby frequent, individualised and non-punitive feedback has been shown to be effective in helping primary care providers to adhere to clinical practice guidelines (Hysong, Best, & Pugh, 2006). Indeed, a meta-analysis that applied FIT to health care research suggested that providing frequent 'correct solution' feedback (i.e. information that helps the feedback recipient see what must change in order to improve performance), and providing feedback in written rather than verbal or graphical form had the greatest effect on outcomes (Hysong, 2009).

1.3. What is the evidence that MFSs do what they are supposed to do?

MFSs that use valid, reliable and standardized measures have been found to be of substantial benefit in both adult and youth mental health practice settings

(Bickman, 2008; Davies, Burlingame, Johnson, Gleave, & Barlow, 2008; Kazdin, 2008; Slade, Lambert, Harmon, Smart, & Bailey, 2008). A meta-analysis summarised the evidence on the effectiveness of feedback of service outcomes in mental health services, and based on the results of twelve controlled trials, the authors concluded that feeding back treatment outcomes to practitioners and service users results in a positive short-term effect on the mental health of service users (Knaup, Koesters, Schoefer, Becker, & Puschner, 2009). In this way, providing outcomes continuously and regularly to both clinicians and patients, and providing information on treatment progress can have beneficial effects on the mental health of the clients using the service.

Similarly, a meta-analytic review of a particular MFS that provided clinicians with information about patients predicted to have a negative treatment response, found the system to be effective in enhancing treatment outcome and in preventing treatment failure. The MFS provided patient progress information to clinicians, which meant clinicians were able to intervene before treatment failure occurred (Shimokawa, Lambert, & Smart, 2010). This meta-analysis provides further evidence that MFS can do what they are intended to do when implemented appropriately.

1.4. Barriers to MFS implementation

However, the implementation of MFSs into services remains a frequent challenge. Ultimately, the successful implementation of MFSs depends on the commitment of the front line service deliverers to amend their working practice according to feedback.

Theories in the healthcare literature relating to changing clinician practice suggest that the two most important internal clinician factors involved in behaviour change are 'motivation' and 'ability'. These factors have been integrated into a theory of applied behaviour change called the 'Contextualized Feedback Intervention Theory' (CFIT; Riemer, Rosof-Williams, & Bickman, 2005) (Figure 1). In relation to MFSs, the theory predicts that clinicians will only integrate the MFS into their working practice if they are committed to the goal of the MFS, are able to recognise when they haven't accomplished this goal, are motivated to move

towards the goal and are ready to accept personal responsibility if they are not moving toward the goal. Additional factors that have been shown to influence the amount of attention a clinician will pay to feedback and how likely they are to accept it include the source, content, sign (positive or negative) and format of the feedback (Sapyta, Riemer, & Bickman, 2005).

Similarly, the 'Theory of Planned Behaviour' (TPB; Ajzen, 1991) provides a framework in which to understand an individual's likelihood of carrying out a target behaviour. The model proposes that the best predictor of behaviour is intention, and intention is influenced by three main factors: an individual's attitude toward the behaviour, their subjective norms, and their perceived behavioural control (Figure 2). When applied to the individual adoption of new behaviours, the TPB model predicts that altering the three mediators of behaviour intention will lead to a change in individual behaviour (Perkins et al., 2007). In this way, applying the TPB to the uptake of MFSs, it is important to consider the staff member's views on the expected value of implementing the MFS, their relevant social norms (such as the expectations of their team, as well as sources of intrinsic and extrinsic motivation to evaluate their service) and how much the staff member feels able to carry out this behaviour.

The reasons that clinicians and managers give for not using MFS in their services (Bickman, 2008; Hatfield & Ogles, 2004; Johnston & Gowers, 2005; Meehan, McCombes, Hatzipetrou, & Catchpoole, 2006) can be grouped according to particular components of these psychological models. For example, reasons of "ambivalence", "low clinical utility", "low scientific merit" and "differences in values" seem to reflect behavioural beliefs and attitudes towards the behaviour (TPB), as well as indicting a potential lack of commitment to providing effective/evidence-based services (CFIT). "Competing work demands", "lack of support from senior staff", "amount of paperwork", "large time burden", and "insufficient resources" may reflect both subjective social norms and perceived behavioural control (TPB), as well as indicting that personal responsibility for behaviour change is not being taken (CFIT). To some extent these factors can be construed as general barriers to service improvement, although the more specific MFS barriers may be include "lack of direct, tangible benefits from

implementation", as the benefits of using MFSs are typically seen in the longer term, at an organizational or service user level, rather than an individual service provider/clinician level (Bickman, 2008; Riemer et al., 2005). Professional complacency may also help to explain some of this resistance. Based on anecdotal feedback from clinicians, Bickman (2008) suggested that a higher sense of efficacy in one's professional role results in lower motivation to adopt anything new into one's practice. However, professionals should be wary of such complacency, as there is little empirical support that experienced clinicians produce better outcomes (Barber, Sharpless, Klostermann, & McCarthy, 2007; Brosan, Reynolds, & Moore, 2007).

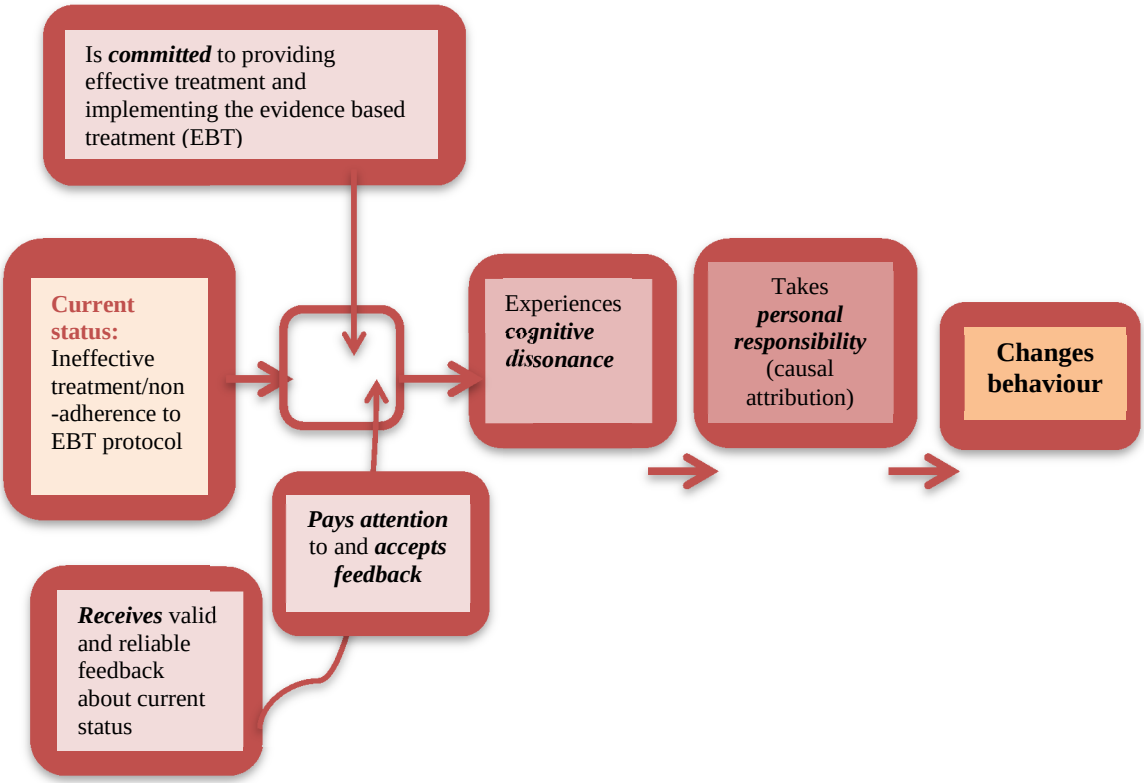


Figure 1. Contextualized Feedback Intervention Theory model (Riemer et al. 2005)

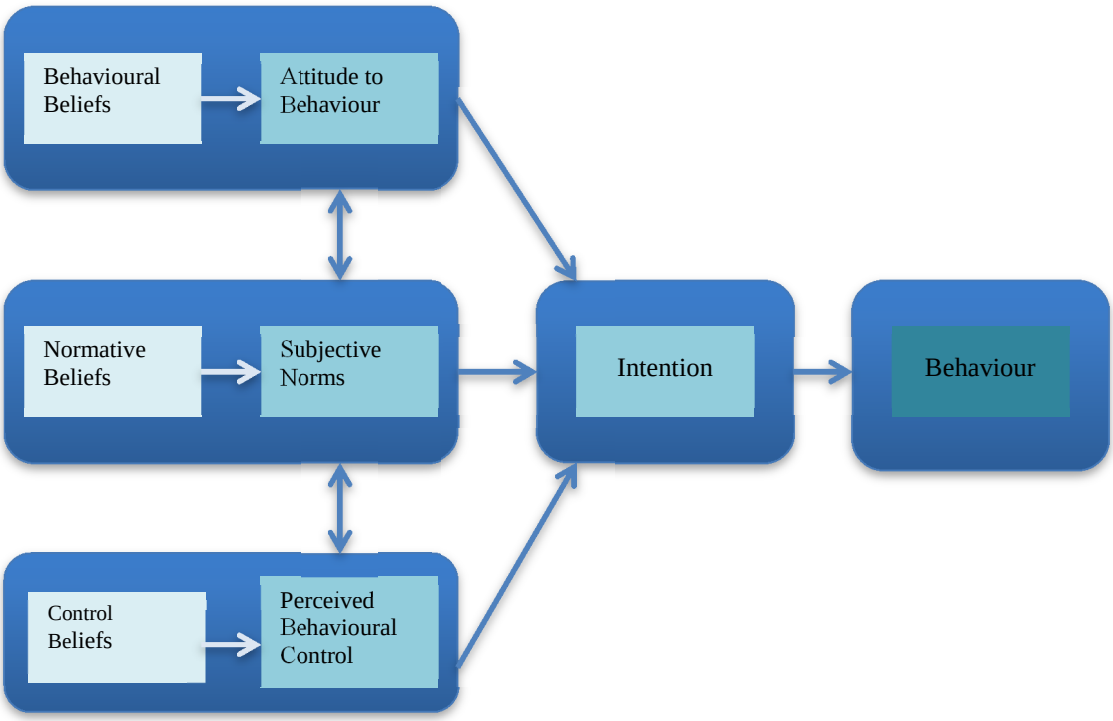


Figure 2. Theory of Planned Behaviour model (Ajzen, 1991)

1.5. MFS implementation in third sector organisations (TSOs)

Many third sector organisations (TSOs) are mindful of the need to evidence their service effectiveness for the purposes of raising funding or attracting volunteers (Kendall & Knapp, 2000). However, due to the development of more intensive performance regimes in the public sector and shifts towards outcomes-based commissioning (Dacombe, 2011; Ellis & Gregory, 2008; Wimbush, 2011), TSOs have needed to increase their efforts in evaluating and measuring the impact of their services in recent years (Ellis et al, 2008; Ógáin, Lumley, & Pritchard, 2012).

The present study is concerned with the implementation of a MFS in a third sector youth mentoring service. Conceptually, youth mentoring programmes pose some specific challenges for assessment because they operate at two levels: that of the dyadic relationship and that of the program (Deutsch & Spencer, 2009). To date, emphasis has been placed on evaluating the effectiveness of mentoring programmes by assessing specific youth outcomes. For example, one large-scale

RCT in the United States assessed youth functioning outcomes of a mentoring programme and found that youth with a mentor were less likely to start using drugs or alcohol, less likely to hit someone, had improved school attendance and performance, improved attitudes towards completing school work and improved peer and family relationships (Tierney, Grossman, & Resch, 1995). Similarly, a meta-analysis of more than 55 studies found a small but significant positive effect for mentees in the areas of enhanced psychological, social, academic and job/employment functioning as well as reductions in problem behaviours (DuBois, Holloway, Valentine, & Cooper, 2002).

Although such empirical testing has provided important information about the potential impact of mentoring on psychological and academic outcomes, less is known about the mentoring process and how the organisational structure can facilitate successful youth outcomes (DuBois & Karcher, 2005; Rhodes & DuBois, 2008). Deutsch & Spencer (2009) suggest that in order to fully understand what contributes to quality mentoring, the characteristics and experiences of individual mentors and mentees, the nature and quality of the dyadic relationships they form and the programs in which they are embedded must be examined. These outcomes were of interest for the youth mentoring service involved in the current study.

1.6. Consultancy role of clinical psychologists in implementing MFS in TSOs

Partnership working between the National Health Service (NHS) and TSOs has been encouraged in the UK for many years, and in mental health care there have been some good examples of such collaborations (Sugarman, 2007; Tait & Shah, 2007). Clinical psychologists working within the NHS are expected as a profession to display 'leadership behaviours', in order to ensure quality services for patients (Department of Health, 2004). It is thought by the British Psychological Society (BPS) that 'the core psychological competencies and relationship expertise (of clinical psychologists) in engagement and collaboration serve as valuable tools for effective leadership' (BPS, 2010). In their 'Clinical Leadership Competency Framework' the BPS detail five key domains of leadership relevant to clinical psychologists. These are: 1) demonstration of personal qualities; 2) working with others; 3) managing services; 4) improving services; and 5) setting direction. Given that clinical psychologists, who by nature of their profession are trained to develop

and operationalise service outcome evaluations, and are knowledgeable in theories of behaviour change, it is no coincidence that the profession are more and more frequently being asked to provide consultancy services to TSOs in order to help them with their service development and MFS implementation. However, to date there have been few published case examples of this type of partnership work, and those that do exist, do so only in poster presentation form (Lane & Koehler, 2013; Wright & Gupta, 2010). The following study is one such case example of how collaborative working between NHS clinical psychologists and a youth mentoring TSO resulted in the development, implementation and establishment of a new MFS.

1.7. Study rationale

In June 2012, the youth mentoring charity 'Friendship Works' (FW) approached the Child and Adolescent Mental Health Service (CAMHS) Research Unit of King's College London (KCL) for help in developing a MFS that would enhance their routine evaluation and monitoring of their service. They were interested in developing measures that would help capture key service information for use in service development and approaching service commissioners. The CAMHS Research Unit was sought out as a collaborative partner due to their commitment to provide and sustain evidence-based practices in services for children, adolescents and their families. A clinical psychologist from the CAMHS research team and a clinical psychologist in training took the lead in the consultancy work.

1.8. Study aims and objectives

This report describes the development, implementation and evaluation of a MFS for FW.

The overall aims of the MFS commission were to:

- Produce a MFS for FW to use in quality monitoring and assessment of stakeholder experience.
- Develop a practical guide and a training workshop for caseworkers to support their adoption and sustained use of the MFS.

The specific aim of the MFS evaluation was to:

- Assess the acceptability and feasibility of the MFS from the perspectives of the FW caseworkers in a three-month implementation pilot.

The objectives of the MFS evaluation were:

- To collect quantitative evidence on the caseworkers' fidelity to the MFS in the three-month pilot window.
- To collect qualitative feedback from caseworkers about their experience of using the MFS via a staff focus group.
- To provide recommendations for FW in their use of the MFS beyond the pilot phase.

2. METHOD

2.1. Service context

'Friendship Works' (FW), is a youth mentoring charity that provides adult mentors to children and young people who are having problems growing up in their home and in their social environment. Having been established since 1977, FW is the oldest mentoring charity in England. The team currently provides volunteer mentors to over 150 children aged 5-16 across three London boroughs of Camden, Islington and Southwark. FW views mentoring support as a way in which children can access vital opportunities and build friendships in order to 'get more out of childhood, explore what life has to offer and lead a fulfilling adult life' (http://www.friendshipworks.org.uk/aboutus/what-we-do).
Their organisational structure can be found in the Appendix (Section 9.1).

2.2. Participants

The Chief Executive and Head of Mentoring Services at FW were the staff members involved in the development and conception of the project. Caseworkers were the staff members who took part in the implementation phase (n = 8). Their role in the service included taking referrals, recruiting and training volunteers, assessing children and families, matching children to their volunteer mentors and acting as overall supervisors of the mentor-mentee relationship. As well as initial match meetings, caseworkers were in charge of conducting formal (at 6 months, 12 months, and yearly time points after the initial match meeting) and informal (3

months, 9 months and 18 months) review meetings with mentors, young people and their parents[3]. All parties were involved in the evaluation phase.

2.3. Evaluation standards

FW have Approved Provider Standard (APS) accreditation from the Mentoring and Befriending Foundation. APS is 'the national quality standard specifically designed for mentoring and befriending projects'. It consists of 12 elements which focus on the key management and operational areas that underpin the effectiveness of any mentoring or befriending project (http://www.mandbf.org/quality-standard). In order to achieve APS, projects are required to demonstrate that they meet the requirements of each element every 3 years. Element 11 of the APS stipulates that projects must demonstrate that 'the progress of relationships is regularly and routinely monitored to determine whether they are functioning successfully.' Similarly Element 12 mandates that 'the overall effectiveness of the mentoring or befriending project is evaluated to improve its service and outcomes.' Although never formally discussed, in creating a MFS for FW, we were implicitly assisting FW in their adherence to these two regulatory standards.

2.4. Design

The study was conducted in three distinct phases: development, implementation and evaluation of the MFS.

2.4.1. Developmental phase

The initial phase consisted of formative work to develop a suitable MFS that would derive meaningful data in order to better understand and improve service quality. This work drew on relevant theory and stakeholder perspectives.

2.4.2. Implementation phase

The implementation phase consisted of a three-month pilot in which the caseworkers integrated the newly developed MFS into their workload. A three-

[3] "Initial match meetings" are meetings where potential mentors are introduced to the child and their parents. "Formal review meetings" are face-to-face reviews of the matches carried out by the caseworker separately with the parent, child and volunteer. "Informal reviews" are check-in meetings, and can be either face-to-face or on the phone. For more details see http://www.friendshipworks.org.uk/refer-a-child/referral-process/

month pilot window was chosen as it was expected that during this period caseworkers would have sufficient contact with children and parents in review meetings in order to pilot the new MFS.

2.4.3. Evaluation phase

The evaluation phase consisted of an investigation into caseworker fidelity to the MFS during the implementation phase. The evaluation phase employed a mixed methods design, incorporating a prospective audit of case records with a post-implementation caseworker focus group.

2.5. Measures

Data was gathered on: (1) the number of formal and informal child and parent review meetings due within the pilot window; (2) the number of actual reviews/initial match meetings completed; and (3) the number of reviews/match meetings completed using the MFS. Caseworker fidelity to the MFS was measured quantitatively, as percentage adherence to the MFS during the three-month pilot (i.e. the number of reviews that correctly used the MFS out of the reviews completed). Caseworker experience of using the MFS was assessed qualitatively through thematic analysis of a focus group discussion.

2.6. Procedures

2.6.1. Developmental phase procedure

An initial consultancy meeting took place between the Chief Executive of FW and a clinical psychologist in CAMHS Research Unit in order to specify FW's strategic vision for enhancing their evaluation methodology. FW stated that they tended to rely on informal feedback from parents, mentors and children for feedback about their service, and lacked a more formal feedback system. FW's priority was therefore to work with KCL to develop a systematic MFS which could be used to enhance the quality of the service and inform potential funders about their service outcomes. FW were particularly interested in the impacts of the mentoring programme for children, and the extent to which the mentoring programme is seen as acceptable, relevant, and useful by children, their parents and mentors. Operationalizing this, KCL's task became the identification of relevant child, parent and mentor reported measures for use in quality monitoring (e.g. measures of

personalised goal attainment, relationship quality and psychological functioning) and assessment of stakeholder experience (e.g. measures of satisfaction with the mentoring programme).

A narrative literature review was conducted to identify measures used in evaluations of other mentoring programmes and related interventions in youth services. One key document that was used as a reference was the CYP-IAPT guide on using outcome tools to inform clinical practice in Child and Adolescent Mental Health services (Law, 2012). A preliminary set of candidate measures was produced as a result of the literature search, and their relevance discussed with a senior caseworker. In light of these discussions, established measures were tailored to meet the needs of FWs evaluation goals, and bespoke outcome measures were produced (Table 3; Appendix, Sections 9.2-9.5).

Having produced MFS measures that were acceptable at a managerial level, the next step was to test the measures' acceptability and feasibility as perceived by the caseworkers. An early piloting stage ensued, where the caseworkers were given a week to purposely test out the measures with young people and parents on their caseload. KCL and FW met together after this week to discuss caseworkers initial reactions to the MFS. It transpired that initial responses from stakeholders were very positive, and only small wording changes were made to the forms as a result of their feedback.

KCL produced written guidance notes for the caseworkers, detailing the principles behind the MFS as well as providing practical administrative information (Appendix, Section 9.6). The guidance notes were accompanied by a training workshop hosted by KCL at FW premises. It was intended that a training workshop would not only ensure a standardised administration procedure, but would also provide the caseworkers with a chance to familiarise themselves with the materials before they used them with their cases, as well as a chance to problem solve together about potential implementation difficulties.

2.6.2. Implementation phase procedure

KCL advised FW that in order to assess whether the MFS was to be both beneficial and sustainable in the long-term, the system would need to be trialled by fully integrating it into current practice for a number of months. The inclusion of a formal pilot study would also help FW to discern whether the measures were capturing the information they had initially set out to capture, as well as addressing any practical issues about administration, data storage and interpretation. It was decided that a 3-month pilot window would be a sufficient length of time in order to capture this information.

The 3-month pilot window ran from 1st February 2013 – 31st April 2013 inclusive. It was suggested in discussion with the lead caseworker that the natural opportunity for children and parent data to be collected would be the informal (3 months, 9 months, 18 months) and formal review meetings (6 months, 12 months, 24 months). The timings of these formal and informal review meetings were established independently of the MFS development work. However, as introducing the goal review measure at these review meetings would possibly interfere with matches that were already in progress, it was decided that these forms should initially be used only in new match meetings between the child and their mentor, and then revisited at their formal and informal review meetings thereafter.

2.6.3. Evaluation phase procedure

The evaluation phase was concerned with assessing caseworker adherence to the MFS system (fidelity) and their experience of integrating the MFS into their working practice. It was thought that this information would help FW to get a sense as to whether implementing the MFS would be effective at both an individual (child, parent) and team (caseworker) level. Caseworker opinions about the process of the implementation were garnered through a post-pilot focus group. The post-pilot focus group took place at FW headquarters. The Chief Executive, the Head of Mentoring and six caseworkers partook in the group discussion. The discussion lasted approximately an hour and was chaired by the researcher. Although the focus group was not audio recorded, verbatim notes were taken during the group discussion. The notes were transcribed and thematically

analysed. It was thought that this information would be useful for FW in their decision-making about their use of the MFS going forward.

2.7. Summary figures

Table 1 provides a detailed study timeline. Figure 3 summarises the inputs and outputs at each stage of the intervention. Table 2 provides a summary of the measures included in the final MFS, and Table 3 summarises their administration schedule.

Table 1. Study timeline

Phase	Dates	What was done?	What was the purpose?
1	June – October 2012	Consultancy meeting between KCL and FW Candidate child and parent measures identified and produced: • Child Progress Scale (CHiPS) A 9-item measure of self-reported youth functioning (emotional well-being, family functioning, school functioning, peer relationships and overall functioning) and quality of the mentoring relationship (feeling listened to/understood, child focused, involvement in fun/interesting activities and overall relationship). To be used at all formal and informal review meetings. • Parental Impacts' and Experiences Scale (PIES) A 22-item measure to assess parent-reported impacts of mentoring on youth functioning, parental satisfaction with mentor and parental satisfaction with service. To be used at formal review meetings only. • 'Having a Say' (HAS) 3 visual analogue scales to assist in setting, prioritising and monitoring progress towards valued goals/aims of match. To be used at all match meetings, and all formal and informal review meetings thereafter.	To produce progress monitoring measures and stakeholder experience measures that are relevant to the objectives, methods and intended outcomes of FW. In particular, measures were intended to help with: a) developing an understanding of a child's needs and preferences that can assist in matching b) enhance involvement of children in shaping mentoring activities to better reflect their own concerns/priorities c) identification and reinforcement of progress towards goals and other positive changes d) identification and resolution of difficulties in the mentoring relationship/other unsatisfactory aspects of the placement e) deriving reliable and meaningful evidence on service quality that can be used to support service-wide improvements and inform funders.

		• Mentoring Review Summary (MentORS). 3 free text sections summarising distinct perspectives of youth, parent and mentor about what is going well and what could be better; informed by interviews and scores from previous/ recent HAS, ChiPS and PIES. Final section includes an action plan that is agreed between key informants. To be used at all formal review meetings only.	
1	November – December 2012	Early piloting of measures by caseworkers with parents and children on their caseload. Measures subsequently refined.	To test out initial feasibility and acceptability of measures for caseworkers To optimise the ease of use, perceived benefits and relevance of the measures
1	January 2013	Production of written guide with information for caseworkers about principles and practice of collecting data on the new measures Delivery of training workshop to caseworkers about the collection, recording, interpretation and purposeful use of data	To provide a practical reference that specifies the schedules and other procedures for data collection and feedback mechanisms. To support the services' adoption and sustained use of evaluation measures and to troubleshoot any foreseeable implementation problems.
2	February – April 2013	3-month pilot phase: Caseworkers adopted the MFS into monthly review meetings.	To collect evidence on the feasibility and acceptability of the MFS among caseworkers.
3	May 2013	Analysis of pilot data and focus group with caseworkers.	To understand caseworker experiences of using new evaluation system and to discuss pilot data.
3	June – October 2013	Synthesis of pilot data Preliminary feedback meeting with FW.	To collate information from pilot study and focus group. To share findings with the service and begin to formulate recommendations
3	November 2013 – January 2014	Production of final report and recommendations.	To produce an executive summary of the project and recommendations for the implementation of any new evaluation system beyond the pilot.

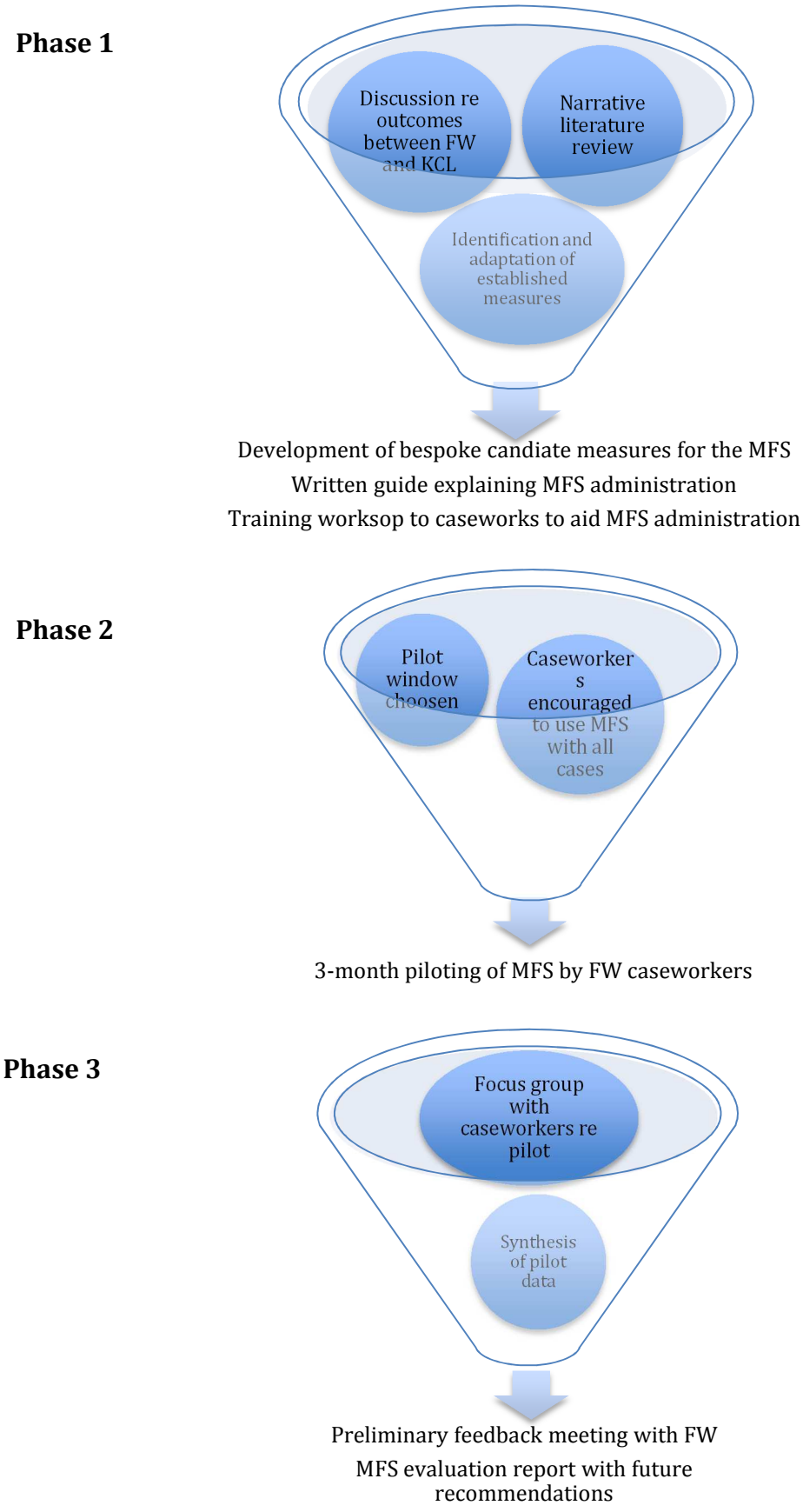


Figure 3. Summary of the inputs and outputs at each phase

Table 2. MFS summary

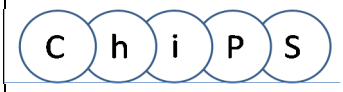
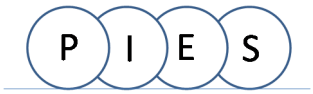
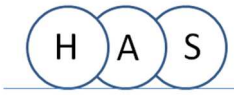
Measure	Summary of content
Child Progress Scale (ChiPS) 	Measures child progress by assessing youth functioning and mentoring relationship quality. Five life domains are addressed in the 'personal functioning' section of the form (emotional well-being, family functioning, school functioning, peer relationships and overall functioning), and four domains in the mentoring relationship section (feeling listened to/understood, child focused, involvement in fun/interesting activities and overall relationship). The child is required to mark the number on the scale that best represents their circumstance at the time of administration.
Parents' Impacts and Experience Scale (PIES) 	Measures stakeholder experience by assessing parent-reported impacts of mentoring on youth functioning, parental satisfaction with mentor and parental satisfaction with service. The parent is required to circle options that best represent their views at the time of administration, as well as providing Y/N and free text answers to particular questions.
Having a Say (HAS) 	Measures mentor-mentee match efficacy by setting, prioritising and monitoring goals/aims of mentor-mentee match. The child is required to identify up to three important goals/aims they want to achieve within the context of the mentoring relationship and to revisit their progress towards these goals at each administration point.
Mentoring Review Summary (MentoRS)	Synthesises feedback from different sources. Its purpose is to develop a shared understanding and action plan that builds on strengths and addresses difficulties in the mentor-mentee matches.

Table 3. MFS administration schedule

Tool	To be completed by	To be completed at
ChiPS	Child	• Match meeting (ChiPS 'personal functioning' form only) • 3-, 9-, 18-month informal reviews • 6-, 12-month and yearly formal reviews
PIES	Parent	• 6-, 12-month and yearly formal reviews
HAS	Child	• Match meeting • 3-, 9-, 18-month informal reviews • 6-, 12-month and yearly formal reviews.
MentoRS	Caseworker	• 6-, 12-month and yearly formal reviews

3. RESULTS

3.1. Caseworker fidelity to the CHiPS

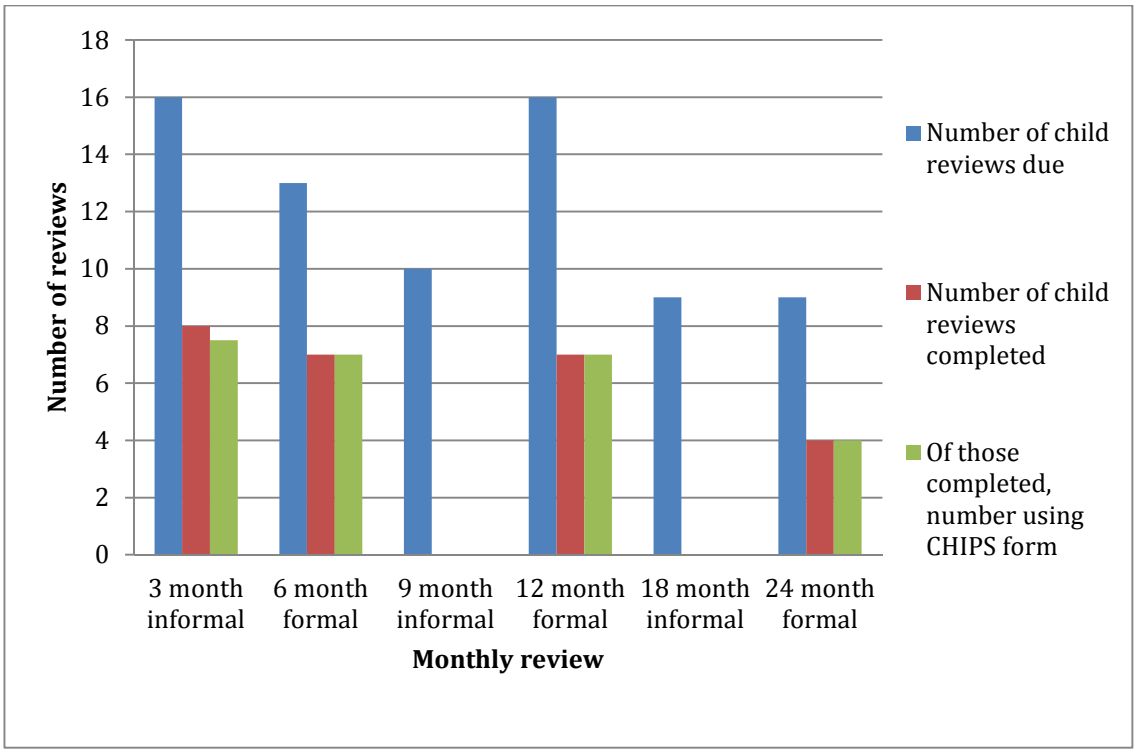


Figure 4. Caseworker fidelity to the child reviews and use of CHiPS (1st February – 30th April 2013)

Figure 4 summarises how well caseworkers managed to adhere to their child review timetable, as well as their fidelity to the CHiPS at these meetings.

3.2. CHiPS data summary

Overall, caseworkers displayed 98% fidelity to the use of CHiPS form. Fidelity for each monthly review is summarised below:

Of the 16 3-month informal child reviews due, 8 reviews were completed (50%). Of these 8 completed reviews, 7 reviews used the full CHiPS form (87.5%). One review used only Part B of the CHiPS form. The reasons for this are unknown. Of the 13 6-month formal child reviews due, 7 reviews were completed (54%). All 7 completed reviews used the full CHIPS form (100%). Of the 10 9-month informal child reviews due, 0 reviews were completed (0%). Of the 16 12-month formal

child reviews due, 7 reviews were completed (43.8%). All 7 completed reviews used the full CHIPS form (100%). Of the 9 18-month informal child reviews due, 0 reviews were completed (0%). Of the 9 24-month formal child reviews due, 4 reviews were completed (44.4%). All 4 completed reviews used the full CHIPS form (100%).

3.3. Caseworker fidelity to the PIES

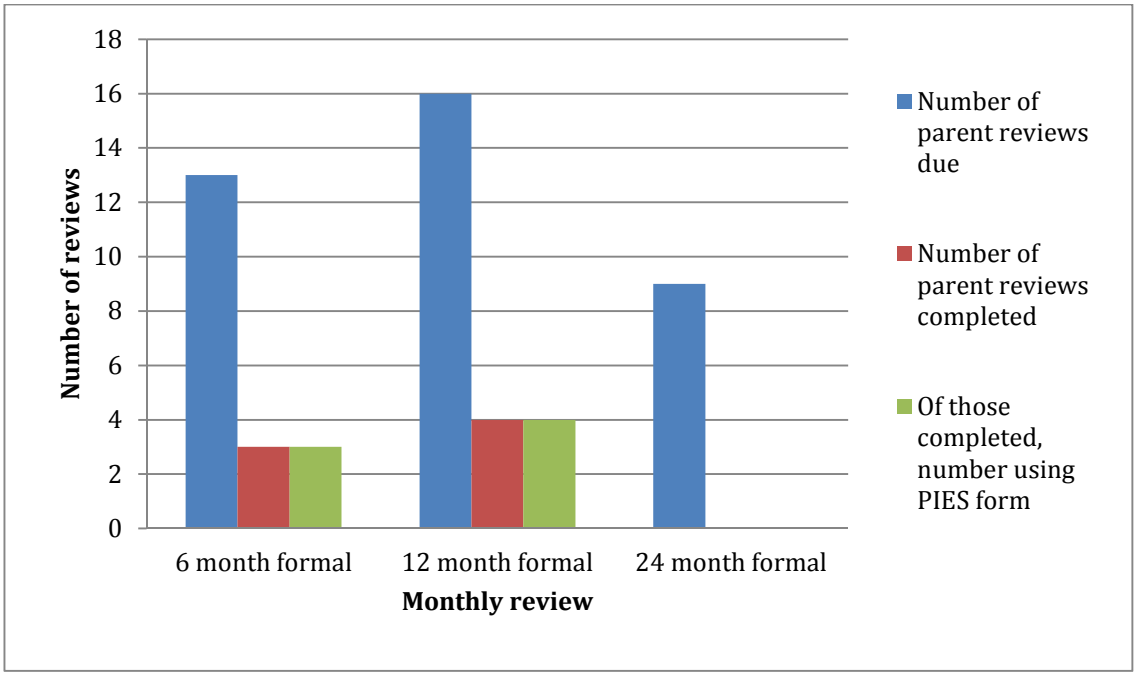


Figure 5. Caseworker fidelity to the parent reviews and use of PIES (1st February – 30th April 2013)

Figure 5 summarises how well caseworkers managed to adhere to their parent review timetable, as well as their fidelity to the PIES at these meetings.

3.4. PIES data summary

Overall, caseworkers displayed 100% fidelity to the use of PIES form. Fidelity for each monthly review is summarised below:

Of the 13 6-month formal parent reviews due, 3 reviews were completed (23.1%). All 3 completed reviews used the PIES form (100%). Of the 16 12-month formal parent reviews due, 4 reviews were completed (25%). All 4 completed reviews

used the PIES form (100%). Of the 9 24-month formal parent reviews due, 0 reviews were completed (0%).

3.5. HAS data summary

No HAS data was available, as no initial match meetings took place within the pilot window.

3.6. MentORS summary

No MentORS data was available, as there was not enough data available to complete this in the pilot window.

3.7. Focus group thematic summary

The following categories of discussion topics emerged from the thematic analysis of the focus group data: face validity, feasibility, utility, and contextual issues surrounding the MFS administration. A summary of the thematic analysis is provided below. Direct caseworker quotes are presented in italics.

3.7.1. Face validity

The "face validity" theme applied to comments about whether the forms measured what they had been designed to measure. Caseworkers were unanimous in the view that both the ChiPS and PIES held strong face validity. No caseworker made any comment about the irrelevance of certain items or questions on the forms, despite explicit questioning.

3.7.1.1 Provision of service feedback

Caseworkers commented that the PIES was particularly useful in gathering parent feedback about the service. The caseworkers were struck by the amount of positive feedback FW received as a result of using the PIES which they felt they '*might not have otherwise received'*. They felt that the addition of a formal feedback structure provided parents with an opportunity *'to feedback to the service in a way that they may not have felt comfortable doing over the phone or face-to-face.'*

3.7.1.2. Provision of caseworker feedback

Some caseworkers found using the ChiPS form personally validating, as it '*confirmed numerically what the children had been verbally saying all along'.*

3.7.2. Feasibility

The "feasibility" theme applied to comments about how easy the forms were to understand and use. Overall caseworkers felt that the ChiPS and PIES were easy to understand from their point of view, but that may some parents and children may need some guidance in completing the forms. The HAS form was seen as infeasible.

3.7.2.1. Caseworker comprehension

The caseworkers had no problems with either the administration or the content of the ChiPS and PIES forms. However, they viewed the HAS form as '*difficult*' to use because it was '*too wordy'.*

3.7.2.2. Recipient comprehension

Caseworkers observed that some children tended only to circle extreme values (0 or 10) of the ChiPS, which made them question whether the child had fully grasped the nuances of the rating scale and whether their answers were reliable.

With the PIES, caseworkers observed that some parents found it difficult to give the form their full attention, and hypothesised whether the length of the questionnaire was a problem. Another caseworker observed that parents with intellectual difficulties and/or parents whose first language was not English found it harder to understand some of the questions.

Although no caseworker used the HAS form in the pilot window, caseworkers worried that the wording might be *'too overwhelming for children*' and thought that children might *'struggle to come up with ideas for goals',* especially in match meetings where they have *'just been introduced to the idea of mentoring',* are *'typically overwhelmed with new information'* and therefore *'don't need the added pressure of having to fill in a form about goals'*.

3.7.2.3. Supports needed

Caseworkers discussed ways in which they could help recipients to better comprehend the forms. Some caseworkers provided verbal guidance to children in

order to help them understand the scoring on the ChiPS scales. Caseworkers who did this commented that they '*had much better success when they went through the questionnaire together with the child rather than simply handing the questionnaire over to them.'* Other caseworkers only provided children with help in interpreting particular questions when the child asked directly for help. No firm conclusions were drawn with regards to how to support parents with intellectual or English language difficulties in filling in the PIES.

3.7.3. Utility

The "utility" theme applied to comments about how useful the MFS (and the accompanying training tools) were in enhancing the review meetings. Overall, caseworkers showed a very positive response regarding the inclusion of the MFS into their review meetings.

3.7.3.1. Provision of structure

The majority of caseworkers felt that having the new forms helped them to '*structure their conversations'* and *'to review progress since last meeting at a glance*'. One caseworker remarked that '*the new forms are much nicer and easier to use than the ones we had before'.* Specifically, the ChiPS was seen as '*a useful record keeping tool'* which provided data that could *'easily be shared with mentors.'*

3.7.3.2. Enabled conversations

With regards to the ChiPS, some caseworkers observed that children were '*better able to open up and be more thoughtful about their experiences'* and became more '*engaged in the conversation'* in comparison to previous review meetings without the form. Other caseworkers found that having numerical data from the ChiPS helped them to see whether there were particular areas that children were struggling with, especially with children who always say "everything is fine". Numerical data provided cues towards problems that caseworkers felt they '*wouldn't have necessarily picked up on previously',* which enabled caseworkers to tailor their conversations with children accordingly.

3.7.3.3. Facilitated engagement

Caseworkers also found that using the ChiPS form as 'a *task to do with the child took the pressure off the child having to talk the whole time*'. One caseworker also noticed that '*children seemed to particularly enjoy being creative and interactive with the forms'* as they would draw smiley faces on the form indicating how they were feeling in particular domains. With regards to the PIES, one caseworker felt that '*it gave the parents the opportunity to think about things in more depth'*, as well as helping parents to feel that their '*views were being listen to and heard more.'*

3.7.3.4. Training tools

The caseworkers fed back that the pre-pilot training session about how to use the MFS *'had helped them to make sense of the content of the forms*' and that the accompanying guidance notes had *'been useful to look at in the beginning [of the implementation phase] for reference'*. However, on the whole, caseworkers had not tended to look at the guidance notes during the pilot window. The Head of Mentoring commented that the printed guidance notes were '*helpful from a managerial point of view as they could be easily given to new staff joining the team.'*

3.7.4. Contextual factors

The contextual theme applied to comments about factors outside of caseworker control that contributed to caseworker fidelity to the MFS. Although the forms themselves were deemed as useful additions to the review meetings, what was more difficult for the caseworkers was finding the time to actually complete the informal and formal reviews, rather than the use of the forms per se. This is reflected in Figures 4 and 5 which highlight the discrepancy between the number of reviews that caseworkers were expected to complete in the three month window, and the number that were actually completed. The caseworkers cited multiple reasons for this discrepancy.

3.7.4.1. Competing priorities

Caseworkers unanimously felt that they had *'too much work to do'*, and that in terms of priorities, review meetings were typically '*the bottom of the list'*. Caseworkers also felt that because there were often problems with completing reviews on time, this meant that the following review was also often delayed, creating a time lag that was '*difficult to keep on top of*'.

3.7.4.2. Problems conducting meetings

Caseworkers also spoke about systematic factors that got in the way of conducting meetings, such as parents who would '*ring up to cancel review meetings last minute'*, which would leave the caseworker with the subsequent problem of trying to find a suitable time to rearrange the meeting amidst their busy schedule. Some caseworkers also described having the experience of being '*stood up'* for meetings. Sometimes they would arrive at the relevant household of the child/parent that they had planned to meet with, and would find that the desired person was not at home.

3.7.4.3. Data storage

One technical problem that the caseworkers encountered was how to electronically store the information generated by the forms. Prior to the start of the pilot, FW were in the process of devising an internal IT system that would enable caseworkers to electronically input individual data from the forms after each review meeting. Such an IT system would provide easy access to the data before review meetings (i.e. removing the need for caseworkers to hunt back through paper forms for a reminder of what was previously discussed). However, as the IT system was relatively new at the start of the pilot, the caseworkers found that they had '*some problems'* in both accessing and navigating their way round the system during the pilot.

4. DISCUSSION

4.1. Summary of main findings

The present study showcased the development, implementation and evaluation of a measurement feedback system for a third sector organisation youth mentoring organisation, 'Friendship Works'. The overall aim of the MFS commission was to produce a bespoke portfolio of candidate measures that the service could use for quality monitoring. A secondary aim was to develop a practical guide and a training workshop for the service in order to support their adoption and sustained

use of the MFS. Both of these aims were achieved in collaboration with practitioner feedback and in a relatively short period of time.

The aim of the evaluation phase was to assess the acceptability and feasibility of the MFS, based on quantitative evidence of its use during a three-month pilot, as well as qualitative feedback from a staff focus group. The results of the evaluation showed parts of the MFS to be acceptable and feasible from the point of view of the caseworkers, with caseworkers demonstrating high fidelity to parts of the MFS in a relatively short space of time (i.e. correct use of the MFS at the appropriate review point), despite the overall completion rate of reviews and MFS forms in the pilot window being lower than expected. Qualitative data from a post-pilot focus group showed the majority of measures making up the MFS to have good face validity, feasibility and utility, with some suggestions regarding formatting and administrative improvements. Contextual issues were highlighted as the biggest barriers to successful integration of the new system. Recommendations to FW in light of the evaluation are discussed in the following section.

4.2. Findings in context of existing literature

Looking at these results in the context of the TPB (Ajzen, 1991), the particularly high fidelity rates to the MFS may be able to be partially explained by the inclusion of procedural elements where caseworkers were specifically asked for their views/concerns surrounding the MFS implementation (i.e. during early piloting and MFS administration training). The TPB argues that directly addressing the cognitions of staff members through individual interventions, can lead to improvements in target behaviour (in this instance fidelity to a new MFS during routine mentor-mentee review meetings). For example, when caseworkers met together during the early piloting phase and raised concerns about whether the CHiPS form would compromise their in-session note taking, it was decided that two versions of the CHiPS form would be produced – one for the child to complete with all the questions on, and one for the caseworkers with the questions removed and blank free-text spaces in their place. Giving key stakeholders in the MFS the opportunity to raise concerns about its implementation and having the developers of the MFS act on these concerns accordingly may have enabled the caseworkers to feel respected, involved and listened to in the MFS development process, and

therefore more likely to adhere to its implementation. In addition, the consultation with caseworkers may also have helped to shift subjective norms about the utility and benefits of MFSs. It would be useful in future evaluations of MFS implementations to measure relevant cognitions, behaviour intentions and subjective norms of the key stakeholders before and after MFS implementation in order to investigate the role of these factors in MFS fidelity.

In a recent review of MFSs in child and adolescent clinical practice, the authors stated that practical design of MFSs 'must contain measures that are short, psychometrically sound, and are useful in everyday practice' (Kelley & Bickman, 2009) in order for them to be most effective at transforming practice. The results of our evaluation are consistent with this sentiment. The CHiPs and the PIES forms that formed part of the MFS in the present study were based on well-established forms (even thought the specific item content was adapted for FW), judged by the caseworkers to not be too lengthy and useful in streamlining their casework practice. As a result, there was near perfect adherence to these measures in the implementation phase. The HAS form however was deemed too lengthy and not seen as a useful addition to casework practice, and although there was no fidelity data available for it, these opinions informed our recommendations to the service to drop it from future MFSs.

4.3. Limitations

A number of methodological limitations should be considered when interpreting the evaluation findings. Firstly, FW is a relatively small TSO, and therefore the number of caseworkers implementing the MFS was also small. It seems likely that high fidelity rates were partly attributable to the small number of workers trialling the MFS, and caution should be taken before extrapolating these findings to the feasibility of implementing MFSs into larger, more corporate TSOs. Secondly, key staffing changes at various points during the implementation meant that at times there was a lack of clarity from within the organisation as to the service's longer-term strategy for implementing the MFS. Thirdly, another limitation of the study was the relatively short audit window. Lengthening the pilot study to six months may have allowed greater caseworker review activity to be captured, and possibly provided an opportunity for the HAS and MentORS forms to be used. The

possibility of a pilot extension was raised at the post-pilot focus group, but staffing changes at that point in time meant that this was not possible. Fourthly, a further methodological limitation of the study was the absence of consultation with service users and mentors. Although feedback on the feasibility, validity and utility of the forms was gathered from parents and children indirectly, direct interviews with parents, children or indeed volunteer mentors about their views of the MFS were not conducted. Again, this was something that was considered during the development phase, but as it became apparent that even the task of arranging review meetings with parents and children was proving problematic, this was not pursued. However, the indirect feedback from these stakeholders via the caseworkers was positive, and in line with caseworker views.

5. DISSEMINATION AND RECOMMENDATIONS

5.1. Dissemination

The results of the implementation and evaluation phase were presented verbally to FW in a briefing meeting, which incorporated a question and answer session to discuss the findings. A summary report was then written and sent with recommendations to the Chief Executive of FW for dissemination in an annual meeting with the board of trustees (Appendix, Section 9.7).

5.2. Recommendations

Given that the implementation of a MFS into FW (a service without any prior means of formal evaluation) was deemed both a feasible and a welcome task, it was recommended to FW that they maintain their commitment to using MFSs in their service evaluation process. Both direct feedback from caseworkers and indirect feedback from service users suggested that continued use of a MFS would be a useful and feasible adaptation to the service. However, given the limitations of the pilot as already discussed, it was also suggested that FW may wish to review the content of the piloted MFS in view of emerging strategic priorities and further development of underlying programme theory.

Specific recommendations to FW in light of the MFS evaluation are summarised below:

1. FW to consider revising the frequency of formal and informal reviews as caseworkers are clearly struggling to adhere to the current review schedules.

2. Further consideration should be given as to how best to store the information collected from the MFS. The IT department should investigate the accessibility of the computer storage system for recording client data, and provide the team with training on how to use the system if necessary.

3. The team should also consider how best to share information collected from the measures between parties. The electronic storage system may help with this, as the information from the forms may be able to be displayed graphically and visually for dissemination to other stakeholders.

4. FW should formally and directly investigate the opinions of stakeholders that were not assessed in the present pilot study (e.g. parents, children and mentors), as these individuals will likely affect the long-term sustainability of the MFS.

5. It may also be particularly useful for FW to consider developing a feedback measure specifically designed to capture the opinions and views of the volunteer mentor. Knowing more about the mentors as population, such as why they volunteer, what makes them more or less likely to continue volunteering, what are their support needs, could help FW in their future recruitment and support of volunteer mentors.

6. It would be useful to repeat the MFS evaluation in the future once FW have established and refined the MFS to take into account more stakeholder perspectives and new managerial priorities. This would provide useful information about the long-term sustainability of changes in practice.

6. LEADERSHIP

The present study acts as a case example to illustrate the consultancy role played by clinical psychologists working with TSOs – a partnership which is becoming increasingly common with the privatisation of the UK health care system. With regards to the five key domains as detailed in the BPS Clinical Psychology 'Leadership Competency Framework', I have attempted to fulfil some if not all of these competencies during the process of this study. In terms of 'demonstrating personal qualities' and 'working with others' I had to establish a relationship with an unfamiliar service (one that I had not previously worked in and had no pre-existing professional relationship with) by liaising both in person and over phone/email with various members of the multi-professional team. I was able to effectively engage with multiple stakeholders in FW, and this resulted in the successful co-design of a service improvement system for them.

With regards to 'managing services' I had to plan and organise meetings that would cause least disruption to my clinical and academic responsibilities, whilst being sensitive to the limited time constraints of the caseworks. I also had to be particularly self aware and act with integrity at times when the study started to demand too much of my time. In terms of 'improving services' and 'setting direction', the overall purpose of the study was to improve the way in which FW monitored and recorded their service outcomes which involved critically evaluating their current service, encouraging improvement and facilitating service transformation. It may be that the high fidelity to the MFS in the pilot phase was partly a reflection of my ability to successfully lead in this way.

7. CONCLUSIONS

Despite the potential barriers to MFS implementation within established organisations, the present study acts a hopeful example that MFSs can be collaboratively designed, implemented, closely adhered to and seen as acceptable in a relatively short space of time when psychologists, service managers and service deliverers work collaboratively with the common goal of improving service quality.

When thinking about developing a MFS for a service, the short-term costs of changing service practice need to be balanced against the potential long-term benefits of the service development. Clinical psychologists are increasingly being called upon to assist services in this thinking process, as they are able to be mindful of the complex mix of organisational- and individual-level factors that contribute to the success of MFS implementation, at the same time as providing expertise in the evaluation of service innovations. Far from shying away from this potentially daunting task, clinical psychologists must step up to these leadership opportunities in order to promote evidence-based working across all our public services.

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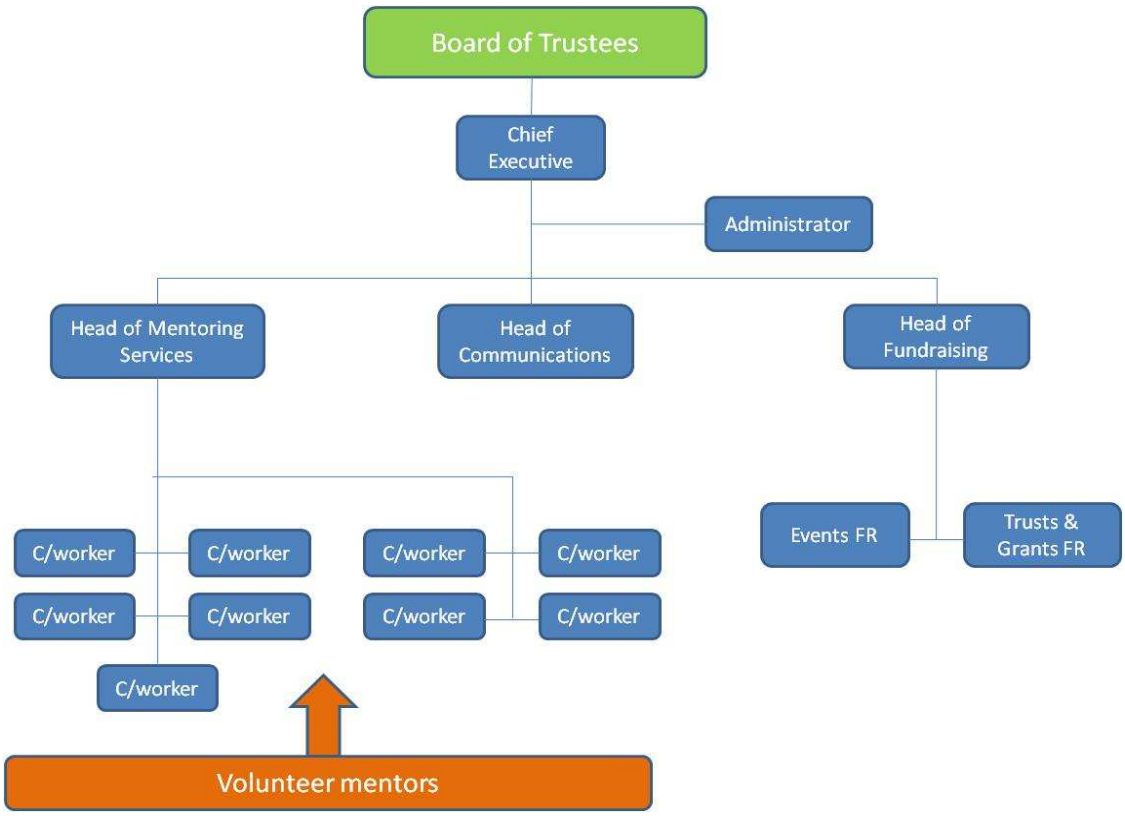
9. APPENDICES

Organisational structure of Friendship Works



c h i P s Child Progress Measure

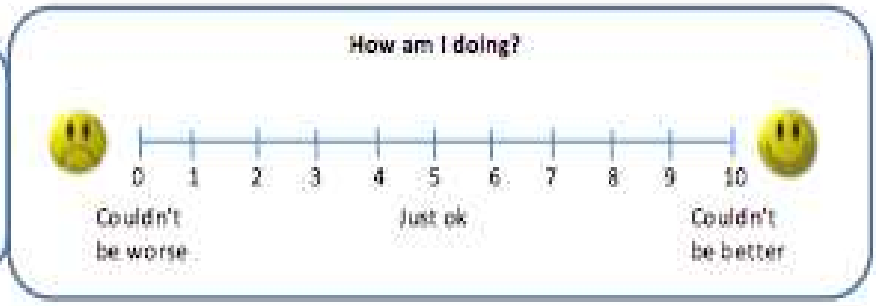
Your name:

Date:

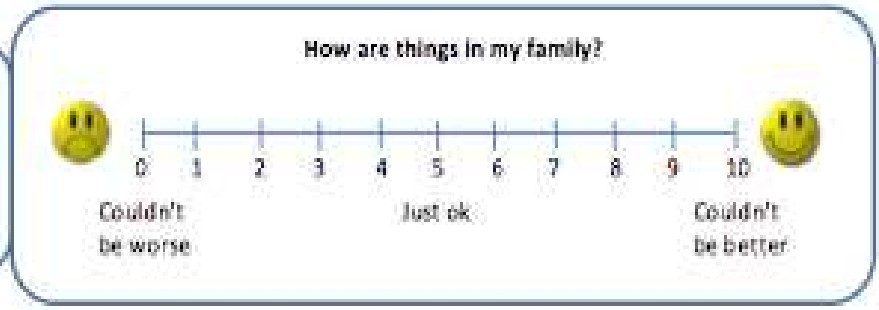
How are things going with *my life?*

Please make a mark on the lines below to let us know how you are doing. The closer to the smiley face, the better things are at the moment. The closer to the frowny face, things are not so good.

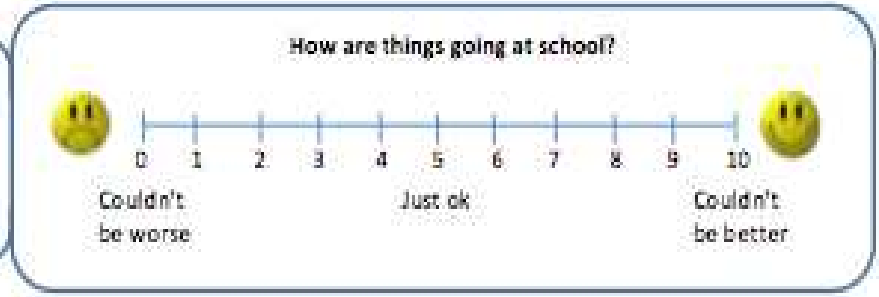
Me



My Family



School



Friends & other kids

Overall

C h i P S Child Progress Measure

Your name:

Date:

How are things going with *my mentor?*

Please make a mark on the lines below to let us know how you are doing. The closer to the smiley face, the better things are at the moment. The closer to the frowny face, things are not so good.

Listening

My mentor never listens or understands me

My mentor always listens and understands me

Important things

We never do or talk about things that are important to me

We always do or talk about things that are important to me

Fun / interesting

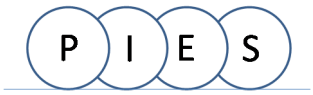
We never do fun or interesting activities together

We always do fun and interesting activities together

Overall

I'm not at all pleased with how things are going with my mentor

I'm totally pleased with how things are going with my mentor



PARENTS' IMPACTS & EXPERIENCE SCALE

PART A. Impacts of mentoring for your child

For each question, please circle the option that best expresses your opinion about how mentoring is helping your child. If the question refers to something that was never a problem for your child, then please circle the option that says "This was never a problem…"

How much is mentoring helping your child….

1) ….to develop new skills and interests?

1	2	3	4	5	6	X
Not at all	*A little*	*Somewhat*	*Quite a bit*	*Very much*	*A great deal*	This was never a problem for my child

2) ….to increase his/her self-esteem?

1	2	3	4	5	6	X
Not at all	*A little*	*Somewhat*	*Quite a bit*	*Very much*	*A great deal*	This was never a problem for my child

3) …to feel happier about life?

1	2	3	4	5	6	X
Not at all	*A little*	*Somewhat*	*Quite a bit*	*Very much*	*A great deal*	This was never a problem for my child

4) …to directly express his/her inner feelings?

1	2	3	4	5	6	X
Not at all	*A little*	*Somewhat*	*Quite a bit*	*Very much*	*A great deal*	This was never a problem for my child

5) …to get along with family?

1	2	3	4	5	6	X
Not at all	*A little*	*Somewhat*	*Quite a bit*	*Very much*	*A great deal*	This was never a problem for my child

6) …to get along with other kids?

1	2	3	4	5	6	X
Not at all	*A little*	*Somewhat*	*Quite a bit*	*Very much*	*A great deal*	This was never a problem for my child

7) …to get along with teachers?

1	2	3	4	5	6	X
Not at all	*A little*	*Somewhat*	*Quite a bit*	*Very much*	*A great deal*	This was never a problem for my child

8)…to achieve their academic potential?

1	2	3	4	5	6	X
Not at all	*A little*	*Somewhat*	*Quite a bit*	*Very much*	*A great deal*	This was never a problem for my child

9) Please list 1 or 2 other areas where mentoring is helping your child and/or family.

_____

_____

_____

_____

PART B. Your experience of mentoring

We would also like to know how you and your child are getting on with the mentor. Please circle the option that best expresses your opinion.

10) How easy is it to talk about your child with the mentor?

1	2	3	4	5	6
Not at all	*A little*	*Somewhat*	*Quite a bit*	*Very much*	*A great deal*

11) How easy is it to make or change arrangements with the mentor?

1	2	3	4	5	6
Not at all	*A little*	*Somewhat*	*Quite a bit*	*Very much*	*A great deal*

12) How satisfied are you with the quality of the relationship between your child and the mentor?

1	2	3	4	5	6
Not at all	*A little*	*Somewhat*	*Quite a bit*	*Very much*	*A great deal*

13) How satisfied are you with the activities your child has been doing with their mentor?

1	2	3	4	5	6
Not at all	*A little*	*Somewhat*	*Quite a bit*	*Very much*	*A great deal*

14) Has your child visited their mentor's home?

Yes **No**

15) If yes to Q14, are you satisfied with this?

Yes **No**

16) Please list 1 or 2 things that are going well with the mentor

_____

_____

_____

_____

17) Have there been any difficulties with your child's mentor?
If so, please list 1 or 2 things that could be different or improved

_____

_____

_____

_____

PART C. Your experience of Friendship Works

Finally, we would like to know your views about the overall service provided by Friendship Works. Please circle the option that best expresses your opinion.

18) How satisfied are you with the quality of communication between your family and the Friendship Works case worker?

1	2	3	4	5	6
Not at all	*A little*	*Somewhat*	*Quite a bit*	*Very much*	*A great deal*

19) How easy is it to let the case worker know about difficulties with your child's mentor?

1	2	3	4	5	6	X
Not at all	*A little*	*Somewhat*	*Quite a bit*	*Very much*	*A great deal*	There have not been any difficulties

20) Overall, how satisfied are you with your family's experience of Friendship Works?

1	2	3	4	5	6
Not at all	*A little*	*Somewhat*	*Quite a bit*	*Very much*	*A great deal*

21) Would you recommend Friendship Works to other families?

1	2	3	4	5	6
Not at all	*A little*	*Somewhat*	*Quite a bit*	*Very much*	*A great deal*

22) Please list 1 or 2 things that we can do in order to improve our service.

_____

_____

_____

_____

_____

MANY THANKS FOR TAKING THE TIME TO ANSWER THESE QUESTIONS!

Your feedback will help us to improve the work that we do with children and families.

My Name: My Mentor: Date:

Having A Say!

Please write down 3 things that YOU want to DO or ACHIEVE by having a mentor. It could involve doing fun or interesting activities together. It could involve learning or trying new things. Or maybe you just want to get to know each other better!

You can check your progress by putting marks on the lines below.

Have a say in what happens! Share your ideas with your mentor. Then you'll both know what's really important.

TIP! How will you and your mentor know that important things have happened? Write 1 or 2 things that will show this.

The most important thing I want to do is_____

This hasn't happened at all ----------> I'm getting closer ----------> It has happened!

I'll know this when...

Another thing I want to do is_____

This hasn't happened at all ----------> I'm getting closer ----------> It has happened!

I'll know this when...

A third thing I want to do is_____

This hasn't happened at all ----------> I'm getting closer ----------> It has happened!

I'll know this when...

REMEMBER! You can always change these at a later time - or add new ones when older ones are finished.

H A S

MENTORING REVIEW SUMMARY

Child name: Case worker name:

What is going well?	What could be better?

Parent name: Mentor name:

☐ 6 month ☐ 12 month ☐ 2 years ☐ 3 years ☐ ___ years

CHILD / YOUNG PERSON'S PERSPECTIVE

What is going well?	What could be better?

Outcome:	Earlier scores	Latest scores	Change? + Better = Same - Worse
Goal 1:			
Goal 2 :			
Goal 3:			
ChiPS Me:			
ChiPS Family:			
ChiPS School:			
ChiPS Friend:			
ChiPS Overall (life):			
ChiPS Listening:			
ChiPS Important:			
ChiPS Fun/interesting:			
ChiPS Overall (mentor):			

PARENT'S PERSPECTIVE			
Outcome:	Earlier scores	Latest scores	Change? + Better = Same - Worse or N/A
PIES new skills/int			
PIES self-esteem			
PIES happy			
PIES express feelings			
PIES family			
PIES other kids			
PIES teachers			
PIES academic			

MENTOR'S PERSPECTIVE	
What is going well?	What could be better?

ACTION PLAN (what could child, parent, mentor and case worker agree to do differently in the next six months in order to strengthen the match? Plans should be discussed, agreed and shared with C/YP, parent and mentor)

Applying service user feedback in youth mentoring:

A practical guide for Friendship Works

Background

Measurement feedback systems are increasingly common in service organisations. Their usefulness depends on the extent to which measurements are valid (information collected in a meaningful way), reliable (information collected in a consistent way), acceptable (information collected in a way that is easy to understand, interpret and apply) and feasible (information collected in a practical way).

These principles have informed the development of a new feedback system for Friendship Works. Its purpose is to provide systematic data that can assist with the following:

- Monitoring the quality of user experience and outcomes for individual families and identifying areas in which mentoring matches can be strengthened
- Enhancing communication and mutual understanding about needs and progress within important dyads (i.e. youth-case worker, youth-mentor, parent-mentor, parent-case worker and mentor-case worker)
- Increasing participation of youth in decision-making about mentoring activities
- Empowering youth to become more confident and influential in mentoring relationships

Other functions, which are not specifically covered in this guide, are:

- Identifying and evaluating targets for service improvement
- Providing robust evidence about service experience and outcomes that can be shared with funders and other stakeholders

What is included in this guide?

This guide includes suggestions for case workers about using the new feedback system in routine practice. It is not intended to be a substitute for professional experience and supervision, but as a helpful resource that can be applied flexibly to fit the circumstances of different mentoring pairs and families. Recommendations about collecting, combining and responding to feedback have been based on previous research and guidance about measurement and quality improvement in children's services (e.g. Michelson & Day, 2012; CO-OP, 2012), as well as input from staff and service users of Friendship Works.

What feedback is collected and when?

The feedback system includes (a) three pen-and-paper questionnaires that are completed at different times by youth and parents and (b) a Mentoring Review Summary form that is completed by case workers to coincide with formal review meetings. The schedule and functions of these feedback tools are outlined in Table 1 below.

Please consult with your manager for guidance on other important data collection activities, such as registering referrals, undertaking initial assessments for matching, and documenting supervision/other contacts with volunteer mentors.

Table 1. Summary of feedback tools

Tool	Completed by	Completed at	Description	Purpose
Having A Say (HAS)	Youth	Each meeting, i.e. match meeting; 3-, 9-, 18-month informal reviews; 6-, 12-month and then yearly reviews.	3 visual analogue scales corresponding to prioritised goals/aims; each scored 1-10 with higher scores indicating more progress.	To assist in setting, prioritising and monitoring progress towards valued goals/aims of match.
Child Progress Scale (ChiPS)	Youth	Each meeting, i.e. match meeting*; 3-, 9-, 18-month informal reviews; 6-, 12-month and then yearly reviews. *ChiPS-Personal Functioning only	9 questions split into 2 sections: (a) Personal Functioning (how are things going with my life?) and (b) Mentoring Relationship (how are things going with my mentor?).	To assess self-reported youth functioning (emotional well-being, family functioning, school functioning, peer relationships and overall functioning) and quality of the mentoring relationship (feeling listened to/understood, child focused, involvement in fun/interesting activities and overall relationship).

Parents' Impacts and Experience Scale (PIES)	Parent	Formal review meetings only, i.e. 6-, 12-month and then yearly reviews.	22 questions split into 3 sections: (a) impacts of mentoring for child, (b) experience of mentoring and (c) experience of Friendship Works. Includes 16 likert scale items (scored 1-6 where higher scores indicate better outcomes or experience), 4 free text-questions and 2 yes/no questions.	To assess parent-reported impacts of mentoring on youth functioning, parental satisfaction with mentor and parental satisfaction with service.
Mentoring Review Summary (MentoRS)	Case worker	Formal review meetings only, i.e. 6-, 12-month and then yearly reviews.	3 free-text sections summarising distinct perspectives of youth, parent and mentor about what is going well and what could be better; informed by interviews and scores from previous/ recent HAS, ChiPS and PIES. Final section includes an action plan that is agreed between key informants.	To synthesise feedback from different sources in order to develop a shared understanding and action plan that builds on strengths and addresses difficulties in placement.

How can feedback measures be administered?

The first task when introducing any measure is to explain its purpose and format. Extra care should be taken when explaining and checking the meanings of questions and responses for youth and parents who have literacy difficulties. This may require that you read out part or all of a questionnaire and mark responses together.

Time should also be set aside for discussing confidentiality. Permission should be sought before sharing feedback from one informant with another, with assurances that honest feedback is welcomed and very useful as it allows for specific improvements to be made.

It is advisable that completed questionnaires are verified and elaborated using follow-up interview questions. This can help to clarify ambiguous or discrepant responses, as well as exploring why certain scores might have improved, stayed the same or worsened. Versions of the HAS, ChiPS and PIES without response scales (but with questions intact) are available for ease of note taking.

Some general Do's and Don'ts of administering questionnaires are listed below (adapted from CO-OP, 2012).

Do:

- Make sure you have the required questionnaires in advance of a review meeting
- Explain why you are asking someone to fill out a questionnaire
- Look at the answers
- Discuss the answers with respondents
- Share the information in supervision
- Always use information from questionnaires in conjunction with other information sources
- Explore ambiguities and inconsistencies that may exist within and between completed questionnaires and other sources of data
- Use the feedback to track progress and plan

Don't:

- Give out a questionnaire to someone who doesn't understand why they are being asked to complete it
- Give out a questionnaire if you don't understand why you are using it
- See the data generated from questionnaires as absolute facts
- Prioritise data obtained from adults over data reported by youth

How can the individual measures be used?

Having A Say: HAS

Previous research has shown that children and young people value professionals taking time to understand their personalised and specific preferences about desired outcomes (i.e., goals, aims, wishes). It is also well established that goal-setting can improve outcomes by guiding and directing behaviour, providing clarity about what a service user considers important and increasing motivation to achieve. The HAS is designed accordingly, so that young people can decide for themselves what they most want to get out of mentoring, and then track progress towards these personalised objectives.

Some children and young people will have very clear ideas about what they want to do or achieve, whereas others may require more prompting. In any event, some degree of collaboration is usually a good idea to ensure that goals/aims/wishes are reasonably focused and achievable, while still keeping to the spirit of what the child/young person wants to achieve. For example, if a teenager wanted to "feel less bored" it might be

helpful to break this broad statement down into more focused goals, e.g. “to spend more time playing sports with other people, including my mentor.” By the same token, discussion of longer-term ambitions (“to be a vet when I grow up”) can lead to identification of shorter-term, measurable objectives (“to visit the Zoo and City Farm” or “to learn about different animals with my mentor”). The boxes on the right of the HAS form can be used to operationalise goals/aims/wishes in this way.

The first iteration of the HAS should be completed at the initial matching meeting in the company of the mentor. This allows the child/young person to influence choices from the outset and can help with early relationship building and communication. By reviewing the HAS on a regular basis thereafter, it is possible to monitor whether or not a placement is fulfilling a child/young person’s expectations. Once goals/aims/wishes have been accomplished or no longer considered important, new items can be added to the HAS. Regularly checking in and discussing progress/priorities in this way can increase a young person’s sense of mastery and influence over mentoring activities.

Child Progress Scale-Personal Functioning: ChiPS-PF

The first part of the ChiPS is designed to assess how a child/young person is functioning in everyday life. The data can be used to extend beyond personalised goals/aims/wishes in order to understand more generalised impacts. It may also be possible to pick out certain domains (e.g. functioning at school) that do not appear to improve, or even worsen over time. This can be used to plan new mentoring activities that reflect emerging needs.

Child Progress Scale-Mentoring Relationship: ChiPS-MR

The second part of the ChiPS measures the perceived quality of the mentoring relationship. This allows relationship problems to be identified and addressed proactively. Positive feedback is also useful, as it shows that a placement is on the right track and indicates favoured approaches that should be continued.

Parents’ Impacts and Experience Scale: PIES

The PIES provides a parental perspective on youth functioning (section 1) and the quality of mentoring relationships (section 2). Additional information is collected about the quality of support available from case workers and the experience of using Friendship Works more generally (section 3). The latter can be collected using a detachable page and returned anonymously to Friendship Works through the post.

How can feedback be integrated and used in formal reviews?

There is a large amount of evidence showing that feedback has greatest influence when results are shared with service users and translated into specific action plans. The Mentoring Review Summary (MentoRS) form is designed to assist with the key

tasks of summarising feedback from the measures described above, and combining it with other data to inform an action plan.

This may involve the following steps prior to, during and immediately after formal review meetings:

1. Compare current and previous questionnaire responses to establish the trajectory of goal attainment, mentoring relationship ratings and personal functioning, as reported by youth. Prospective scores can be recorded on the MentoRS and plotted on a graph.

2. Present these findings to the child/young person. Encourage them to reflect upon aspects of the placement that are currently going well and what has/hasn't improved over time. Useful prompts may include: what difference has your mentor made to [ChiPS-PF items]? What would need to be different in order to score [ChiPS-PF/ChiPS-MR items] higher? Are your original goals still important to you?

3. Summarise this information in the "what's going well" and "what could be better" sections of the MentoRS.

4. Repeat 1-3 for parent-reported data, paying particular attention to any major discrepancies in how the child/young person and parent may be experiencing the placement.

5. Summarise "what's going well" and "what could be better" from the perspective of the mentor. This can be based on your ongoing contacts/supervisions with the mentor, as well as a formal one-to-one progress review.

6. Distil the main perspectives into a brief written summary that includes details of agreed strengths/positives about the placement, areas for improvement and any extenuating circumstances.

7. This summary should be linked to a set of agreed actions on the part of the child/young person, parent, mentor and case worker. Provisional actions may be decided during individual meetings (i.e. steps 2, 4 and 5 above) and then confirmed through follow-up telephone calls or other contacts, as needed.

8 If possible, a final summary and action plan should be checked for accuracy and acceptability and then shared in writing with each of the key informants. Careful judgment will be needed when deciding how to incorporate strongly critical feedback and opposing positions. Although positive feedback is reassuring, mentors should be encouraged to see the value of negative feedback that allows for specific adjustments to be made in how they relate to their mentees and families. Disagreements should be framed in non-accusatory terms with an emphasis on constructive ways forward.

It may be useful for actions to be written in an active voice (known to increase likelihood of implementation), as below:

Child: I will help things to go even better with my mentor by….

Parent: I will help things to go even better in this match by….

Mentor: I will help things to go even better in this match by….

Case worker: I will help things to go even better in this match by….

9 Implementation and outcomes associated with these actions should be scrutinised at the next annual review meeting. Informal checks on progress and trouble-shooting may be conducted in the meantime.

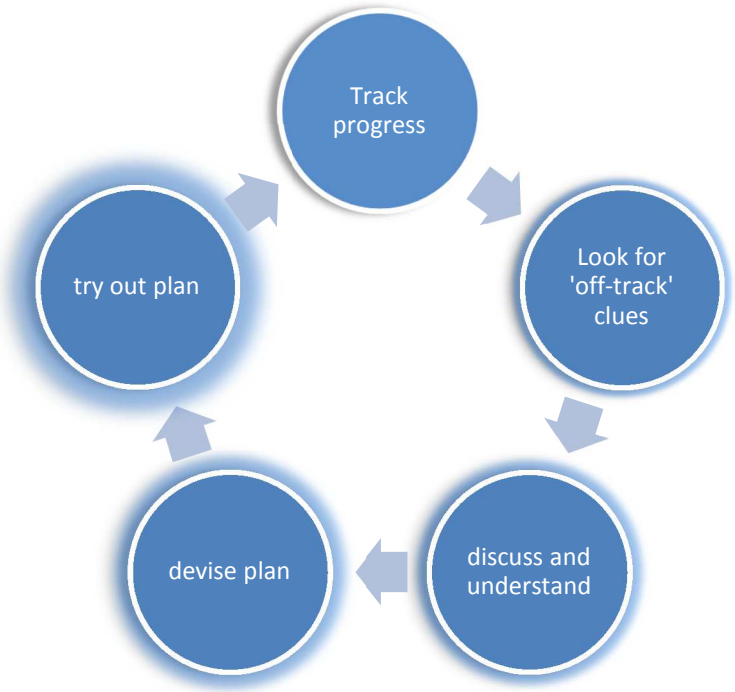
How can feedback be used to monitor progress in between formal reviews?

More frequent progress monitoring (i.e. every three months during the first year of the match) offers the potential to pick up clues about emerging difficulties. You may find that the questionnaires help some children and young people to hint at problems that are hard for them to say out-right. By identifying these issues proactively, it may be possible to get things back on track and limit the risk of matches ending prematurely.

As with all questionnaire data, any notable trends should be carefully examined in the context of other available sources and explored directly with the child/young person. It may also be helpful to discuss “off-track” clues in supervision as part of your efforts to understand the problems and devise a plan to get things back on track. Some clues to look out for (with possible interpretations and points for clarification) are:

Clues	Possible interpretations
Large drop in consecutive scores on ChiPS-MR	Might suggest that the C/YP was let down recently or otherwise disappointed by their mentor. Was this a one-off? Does the mentor realise what has happened?
Large drop in consecutive scores on ChiPS-PF	Has there been a sudden life event? Is this something that the C/YP can discuss with their mentor?
General decline in ChiPS-MR or flatlining some way below max. score	Might suggest consistent problems in the relationship, i.e. mentor not following the C/YP's priorities, not providing opportunities for fun/interesting activities, not showing sufficient interest in the C/YP
Minimal or slow goal attainment	The C/YP may be finding it hard to achieve their goals. Does this reflect a problem in the relationship? Is mentor aware and facilitative of goals? Are the goals clearly defined, realistic and still relevant? Are any external factors hindering goals?

Looking for and responding to such clues can be part of an on going cycle, as shown below (adapted from CO-OP, 2012).



When is the feedback system going to be in use?

The feedback system is intended to be used for all new and existing matches from 1/2/13. The only exception is that goals/aims/wishes should be formulated with new matches only.

An evaluation of the workings of the new system is being undertaken simultaneously by a team of psychologists at the Institute of Psychiatry, King's College London. Decisions about longer-term sustainability and adaptations will be made in light of the evaluation findings. In the meantime, you can contact the team with any questions at daniel.m.d.michelson@kcl.ac.uk and claudia.hallett@kcl.ac.uk.

References

Children and Young Peoples' Improving Access to Psychological Therapies Outcomes-Oriented Practice (CO-OP) Group (2012). *A practical guide to using service user feedback and outcome tools to inform clinical practice in child and adolescent mental health.* Available from www.iapt.nhs.uk.

Michelson, D. & Day, C. (2012). *Child and Adolescent Service Experience (ChASE): Practitioner toolkit. Using client feedback to improve mental health care.* London: King's College London and South London and Maudsley NHS Foundation Trust.

Friendship Works Service Development Project

June 2012 – January 2014

KCL Final Report

Principal Investigator: Dr Daniel Michelson (Senior Clinical Research Associate) on behalf of CAMHS Research Unit, Institute of Psychiatry, King's College London

Project Evaluation Lead: Claudia Hallett (Clinical Psychologist in Training), Institute of Psychiatry, King's College London

AIMS

- To specify, pilot and support the sustained implementation of a robust internal evaluation strategy for Friendship Works (FW).
- To test the acceptability and feasibility of the new evaluation strategy from the perspectives of caseworkers, parents and young people in a 3-month pilot.
- To collect evidence on the caseworkers' uptake of the new evaluation strategy.
- To provide recommendations for FW in their use of the internal evaluation strategy beyond the pilot phase.

METHODS

Dates	What was done?	What was the purpose?
June – October 2012	Candidate child and parent measures identified and produced: • Child Progress Scale (CHiPS) A 9-item measure of self-reported youth functioning (emotional well-being, family functioning, school functioning, peer relationships and overall functioning) and quality of the mentoring relationship (feeling listened to/understood, child focused, involvement in fun/interesting activities and overall relationship). To be used at all formal and informal review meetings. • Parental Impacts' and Experiences Scale (PIES) A 22-item measure to assess parent-reported impacts of mentoring on youth functioning, parental satisfaction with mentor and parental satisfaction with service. To be used at formal review meetings only. • 'Having a Say' (HAS) 3 visual analogue scales to assist in setting, prioritising and monitoring progress towards valued goals/aims of match. To be used at all match meetings, and all formal and informal review meetings thereafter.	To produce progress monitoring measures and stakeholder experience measures that are relevant to the objectives, methods and intended outcomes of FW. In particular, measures were intended to help with: a) developing an understanding of a child's needs and preferences that can assist in matching b) enhance involvement of children in shaping mentoring activities to better reflect their own concerns/priorities c) identification and reinforcement of progress towards goals and other positive changes d) identification and resolution of difficulties in the mentoring relationship/other unsatisfactory aspects of the placement e) deriving reliable and meaningful evidence on service

	• Mentoring Review Summary (MentORS). 3 free text sections summarising distinct perspectives of youth, parent and mentor about what is going well and what could be better; informed by interviews and scores from previous/ recent HAS, ChiPS and PIES. Final section includes an action plan that is agreed between key informants. To be used at all formal review meetings only.	quality that can be used to support service-wide improvements and inform funders.
November – December 2012	Early piloting of measures by caseworkers with parents and children on their caseload. Measures subsequently refined.	To test out initial feasibility and acceptability of measures for caseworkers, children and parents To optimise the ease of use, perceived benefits and relevance of the measures
January 2013	Production of written guide with information for caseworkers about principles and practice of collecting data on the new measures Delivery of training workshop to caseworkers about the collection, recording, interpretation and purposeful use of data	To provide a practical reference that specifies the schedules and other procedures for data collection and feedback mechanisms. To support the services' adoption and sustained use of evaluation measures and to troubleshoot any foreseeable implementation problems.
February – April 2013	3-month pilot phase completed: Caseworkers adopted the new evaluation system into monthly review meetings.	To collect evidence on the feasibility and acceptability of the new evaluation system among caseworkers, children and parents.
May 2013	Analysis of pilot data and focus group with caseworkers.	To understand caseworker experiences of using new evaluation system and to discuss pilot data.
June – October 2013	Synthesis of pilot data Preliminary feedback meeting with FW.	To collate information from pilot study and focus groups. To share findings with the service and begin to formulate recommendations
November 2013 – January 2014	Production of final report and recommendations.	To produce an executive summary of the project and recommendations for the implementation of any new evaluation system beyond the pilot.

FINDINGS

Caseworker use of ChiPS and PIES forms

Figure 1 shows that caseworkers completed about half of the anticipated review meetings with children. However, of the reviews that were completed, caseworkers showed very high rates of using ChiPS. Caseworkers were even less likely to complete reviews with parents at pre-specified time points (see Figure 2). But again, caseworkers consistently used the relevant form (PIES) when meetings with parents did take place.

Caseworker use of HAS forms

Unfortunately no HAS data was collected in the pilot window as no initial match meetings took place during this period. Therefore caseworker use of the HAS remains unclear.

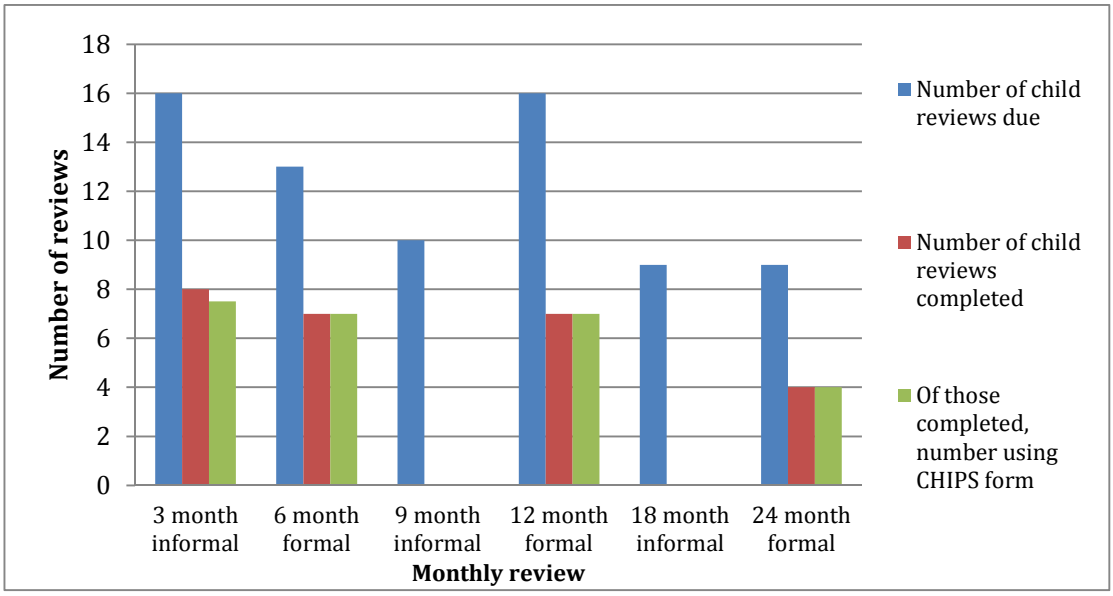


Figure 1. *Caseworker fidelity to the CHiPS measure (Feb – April 2013 data)*

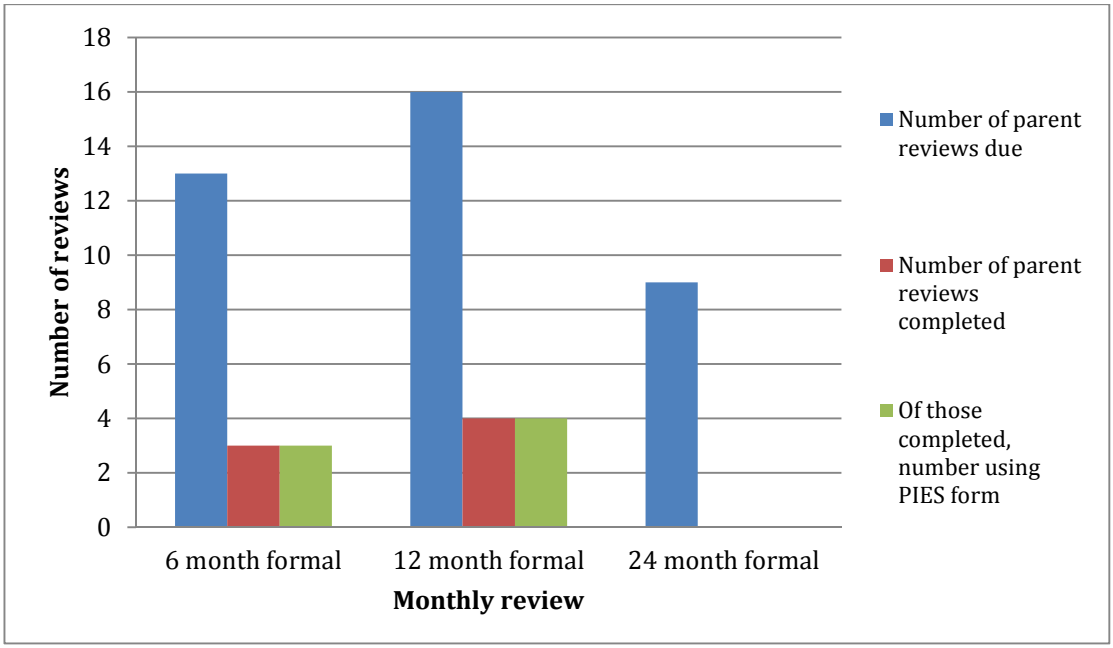


Figure 2. *Caseworker fidelity to the PIES measure (Feb – April 2013 data)*

What worked well?

Feasibility and acceptability

Overall, caseworkers expressed positive views about the feasibility and acceptability of the design and practical application of the measures. One caseworker commented that '*the new forms are much better - nicer and easier to use - than the forms we had before*.' Another described the measures as '*useful record keeping tools that would make sharing information between parties easier.'*

Caseworkers found that using the CHiPS *'helped children to open up and be more thoughtful about their experiences'*, and that the PIES provided parents with an opportunity *'to feed back to the service in a way that they may not have felt comfortable doing over the phone or face-to-face.'* Caseworkers were also struck by the amount of positive feedback FW received as a result of using the PIES which they '*might not have otherwise received*.'

What are some areas for improvement?

Obtaining valid responses

Caseworkers discussed the need to guide young people and/or parents through the completion of the measures in order to reduce the likelihood of inaccurate information. This could be further emphasised in future training workshops.

Data storage

As part of the project, an electronic data storage system was developed by FW in order for the caseworkers to record information from particular measures and have it easily accessible for subsequent review meetings. Caseworkers raised some problems with recording and accessing the electronic data.

Opinions of other stakeholders

Feed back on the measurement system came directly from caseworkers. Although it was possible to obtain an indirect account of how children and parents experienced the use of measures, more direct discussions with other stakeholders would potentially provide additional information of value.

CONCLUSIONS AND RECOMMENDATIONS

Overall, the findings indicate that the new evaluation strategy has been used faithfully by the caseworkers when expected review meetings have taken place. Both direct feedback from caseworkers and indirect feedback from service users suggests that continued use of an evaluation strategy would be a useful and feasible adaptation to the caseworkers' workload. The benefits of an evaluation strategy from the perspectives of other stakeholders have yet to be formally investigated.

Based on the above findings, it is recommended that FW maintains its commitment to adopting a systematic internal evaluation strategy. FW may wish to review the content of the progress monitoring measures and stakeholder experience measures in view of emerging strategic priorities and further development of underlying programme theory.

Additional recommendations are suggested below:

- Consider revising the frequency of current formal and informal reviews as caseworkers are currently struggling to complete these on time.
- Caseworkers to consider how best to share information collected from the measures between parties. Revisit the accessibility of the current electronic data storage system and the utility of the 'MentORS' form in aiding this.
- Before implementing a new internal evaluation strategy, FW may wish to formally investigate the opinions of stakeholders not directly assessed in this study.
- Consider developing a particular outcome measure to capture the opinions and views of the mentor.

January 2014