The University Of Sheffield.

The phenomenon of sudden gains: A meta-analysis understanding how often sudden gains reverse and empirical study exploring how therapists can support sudden gain maintenance.

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A thesis submitted in partial fulfilment of the requirements for the award of Doctor of Clinical Psychology at the University of Sheffield

The University of Sheffield

Faculty of Science Clinical Psychology Unit

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May 2023

Declaration

I, the author, submit this thesis for the award of Doctorate in Clinical Psychology at the University of Sheffield. I declare that this thesis has not been submitted to any other institution for any other reward.

Word count

Abstracts

Lay summary: 482

Literature review: 250

Empirical paper: 250

Literature review

Excluding references and tables: 8000

Including references and tables: 11644

Research report

Excluding references and tables: 7880

Including references and tables: 10654

Total

Excluding references and tables: 15880

Including references and tables: 22298

Lay summary

When individuals undergoing therapy make a large stable improvement in symptoms between two time-points, called a sudden gain, existing research would suggest that they are more likely to have better therapeutic outcomes overall. A sudden gain has been related to improved treatment outcome in individuals undergoing a range of therapies from cognitive behavioural therapy (CBT) to psychodynamic therapy and, for a diverse range of disorders such as anxiety, depression, and eating disorders. Research has since been largely dedicated to understanding the predictors of sudden gains which has resulted in inconsistent findings, leaving a diverse range of possible predictors and a lack of clarity in the research. Not all sudden gains are maintained and lead to superior outcomes, and some individuals experience a sudden gain reversal. This research project, made up of a meta-analysis and empirical paper, aimed to understand more about sudden gain reversals and the therapist guided processes supporting the possible maintenance of a sudden gain.

The meta-analysis aimed to understand the prevalence of sudden gain reversals in individuals undergoing therapy for depression. Study level characteristics predicted to impact the rate of sudden gain reversals included which sudden gain criterion was used, the outcome measure for depression employed and, the type of therapy that was delivered. A systematic search of online databases yielded 22 papers that reported the sudden gain reversal rates for individuals in therapy for depression. The review found that 29% of sudden gains reversed over course of therapy. Higher rates of reversals were observed in therapies such as cognitive therapy and other non-cognitive or behavioural based therapies compared to lower rates in CBT and behavioural activation. Significantly fewer reversals were evidenced when individuals completed the Patient Health Questionnaire-9 compared to other measures for depression. The main paper outlines the limitations and research recommendations in further detail.

As clear in the meta-analysis, sudden gain reversals suggest that not all sudden gains are maintained and lead to superior outcomes. The upward spiral theory hypothesises that when people make a sudden gain in therapy, this leads to increased therapeutic alliance and further cognitive change resulting in superior outcomes. A key paper suggested four components needed to support individuals from a sudden gain to an upward spiral including identifying the gain, exploring reasons for the gain, finding meaning in the gain and leveraging the gain. The empirical paper used a task analysis methodology to explore if the four components support individuals to maintain a sudden gain. The analysis corroborated and adjusted the theorised model. The final model suggested that to support an individual who has had a sudden gain to an upward spiral the therapist should assist them to identify the gain, explore reasons for the gain, stay with the positive discussion around the gain, use the gain and reference the ending of therapy. Large scale validation of the model is needed. Limitations and implications for practice are discussed in the empirical paper.

Acknowledgements

The completion of this thesis would not have been possible without the continued support, genuine interest, and timely feedback of Prof. Gillian Hardy whose input and ideas have been invaluable throughout. An extended special thanks to Prof. Michael Barkham and the clients and therapists involved in PRaCTICED trial whose time and efforts have allowed for this research project to take place. I would like to show my appreciation to Dr Mel Simmonds-Buckley and David Saxon whose knowledge on specific areas of my research have been incredibly helpful.

Whilst a thesis is written independently, I really couldn't have got this done without the incredible support of my cohort, especially Holly McGrellis, Kerry Ardern and Charlotte Graham who have always provided honest thoughts, useful feedback, and emotional support.

I'm forever thankful to my parents who no matter their circumstances have provided for me and gently supported me to be the best I can be. Knowing that I have their unconditional support has been instrumental in my journey so far. And last (but certainly not least) a huge thank you to my partner, Alex, who has been with me every step of the way and stuck with me through the ebbs and flows of the doctorate, thank you.

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Part two: Research report

How can therapists facilitate an upward spiral following a sudden gain?

Part one: Literature review

How prevalent are sudden gain reversals in individuals undergoing therapy for depression and what do we know about them? A meta-analysis and narrative synthesis.

Abstract

Objectives: The meta-analysis aimed to understand the prevalence of sudden gain reversals in individuals undergoing psychological therapy for depression. Study level characteristics hypothesised to influence the rate of reversals included the sudden gain criteria used, the outcome measure employed and therapeutic modality.

Method: A systematic search of Scopus, Medline, PsycINFO, CINAHL and Web of Science was conducted using the terms "Sudden gain*" and "depress* OR depression". Quantitative papers researching sudden gains in individuals undergoing psychological therapy for a primary diagnosis of depression were included, provided they reported the sudden gain reversal rate. Grey literature was included. A random-effects meta-analysis synthesised the prevalence with studies being weighed using the Freeman-Turkey (double arcsine) transformation. Moderator analysis was conducted where heterogeneity was significant. A short narrative synthesis was provided. All studies were quality appraised.

Results: The search yielded 22 papers suitable for inclusion in the quantitative synthesis. Of the 969 sudden gains included, 29% were found to reverse. Papers using the original sudden gain criteria reported lower rates of reversals. Reversals were fewer in papers employing the Patient Health Quesionnaire-9. Cognitive therapy and non-cognitive or behavioural based therapies had higher reversal rates than cognitive behavioural therapy and behavioural activation. Most papers had moderate risk of bias.

Conclusion: The prevalence of reversals appears to be lower in psychological therapies with a behavioural component. The criterion and measures used to define sudden gains also impacts the reporting of reversal prevalence. More consistency in the definition of sudden gains is needed alongside exploration into what supports sudden gain maintenance.

Key Words: Sudden gain, sudden gain reversals, depression, meta-analysis.

Practitioner points:

- Practitioners must monitor individuals' sessional outcomes to identify when a sudden gain has occurred and familiarise themselves with processes hypothesised to support the maintenance of sudden gains.
- Where sudden gains have occurred in cognitive therapy, it may be helpful to discuss behavioural change to support the maintenance of the gain.
- Therapists should use the original Tang & DeRubeis (1999) criteria to identify sudden gains until further agreement on the criteria of sudden gains is agreed in the literature.

Introduction

Sudden Gains and Reversals

The phenomenon of sudden gains made during psychological therapy has been well researched (Aderka et al., 2012) but sudden gain reversals, less so. Whilst there are some discrepancies in the criteria used to establish a sudden gain (Tang et al., 2005), it is consistently defined as a large stable reduction in symptoms between successive therapy sessions (Tang & DeRubeis, 1999). Sudden gains have been repeatedly linked to superior outcomes for clients engaged in psychological therapy (Shalom & Aderka, 2020).

Tang and DeRubeis (1999) proposed that a sudden gain relates to superior outcomes as it instigates an upward spiral. The upward spiral theory was born out of Tang and DeRubeis (1999) findings on the nature of sudden gains in cognitive behavioural therapy (CBT) and Beck et al.'s (1979) cognitive mediation hypothesis. Tang and DeRubeis (1999) found increased cognitive change in the pre-gain session and elevated cognitive change and therapeutic alliance scores in the post-gain sessions. The upward spiral would suggest that following a sudden gain in psychological therapy, the therapeutic alliance is improved, and the client feels more hopeful in therapy. In turn, the clients' sustained engagement in therapy and therapeutic techniques results in further cognitive change that continues the client's improvement in symptoms resulting in superior outcomes by the end of therapy. Lutz et al. (2013) found increased therapeutic alliance in the post-gain session and this finding has been corroborated in Zilcha-Mano et al. (2019) and Wucherpfenning et al. (2017). Bohn et al. (2013) found significant increases in cognitive change in the post-gain sessions in support of the upward spiral theory.

The phenomenon of sudden gain reversals suggests that this upward spiral of continued improvement is not always the client's trajectory in practice. A sudden gain reversal is commonly defined as a loss of more than 50% of the gain in at least one session

following the gain (Tang & DeRubeis, 1999). The establishment of sudden gain reversals highlights that sudden gains can be unstable. Exploration of sudden gain reversals could be instrumental in understanding potential barriers to consistent improvement following a sudden gain.

What Do We Know?

Exploration of sudden gain reversals in the literature is sparse despite them being regularly reported. There is variance in the reported prevalence of sudden gain reversals across studies with Tang and DeRubeis (1999) reporting a low initial estimate of 17% of sudden gainers reversing and Tang et al. (2002) reporting that 47% of sudden gains end in a reversal. A meta-analysis aimed at understating the impact of sudden gains on clients' outcomes and the possible moderators of this effect has previously pooled data reporting sudden gain reversal rates (Shalom & Aderka, 2020). The meta-analysis observed that higher rates of sudden gain reversals significantly moderated the size of the effect the sudden gain had on the client's overall outcome. Despite this review highlighting the possible negative impact that sudden gain reversals can have on a client's symptom improvement, little has been done to understand the factors influencing the rate of sudden gain reversals. Like sudden gains, the rate of reversal and impact of reversals on client outcomes varies between studies. Hardy et al. (2005) suggested that patterns of reversals are affected by similar processes to those that impact the reporting of sudden gains and proposed that treatment with cognitive therapy (CT) and use of clinical trials could produce fewer reversals and more stable sudden gains. Variables predicting sudden gains and the relationship between sudden gains and outcomes could provide further information about sudden gain reversals.

Consistent with the upward spiral theory, it could be argued that sudden gains made within cognitive based therapies are more likely to be stable due to the emphasis on cognitive change. Sudden gains in therapies such as CBT and CT have been well researched (Busch et

al., 2006). Bohn et al. (2013) used data from a randomised control trial (RCT) and concluded that whilst the frequencies of sudden gains were similar in both CT and interpersonal therapy (IPT), sudden gains in CT were a better predictor of improved overall outcomes. Kelly et al. (2007) also aimed to understand the prevalence of sudden gains during IPT for depression and found no significant relationship between a sudden gain in IPT and better outcomes. Tang et al. (2002) further concluded that sudden gains were less stable in therapies like supportive expressive (SE) psychotherapy, suggesting possible increased risks of reversals in non-cognitive based therapies. It is possible therefore that whilst sudden gains are present in different therapeutic modalities, the sudden gain is more stable in cognitive based therapies and may be a better predictor of improved outcomes. Alternatively, Singh et al. (2021) found that sudden gains commonly occurred in experiential therapy and that the sudden gainers also benefited from better outcomes overall. Thus, research is inconsistent with regards to the impact of therapeutic intervention on sudden gain stability, yet there may be differences in prevalence of sudden gain reversals across therapies.

As sudden gains need to be identified to be able to research sudden gain reversals, the applied sudden gain criteria could impact the reporting of sudden gain reversals. The original Tang and DeRubeis (1999) criteria suggested that a sudden gain is a drop of at least seven points of the Beck Depression Inventory (BDI; Beck et al., 1961), the drop represented at least a 25% decrease in symptoms from the previous session, and the mean score over the three pre-gain sessions was significantly higher than the three post-gain sessions. There have been numerous alterations of these criteria (Hardy et al., 2005; Kelly et al., 2005; Tang & DeRubeis, 1999). Stiles et al. (2003) supported the alteration of the first criterion suggesting and modelling a change from seven points on the BDI to a decrease by the calculated reliable change index (RCI; Jacobsen & Truax, 1991). This has been adopted by multiple researchers in the field (Hardy et al., 2005; Masterson et al., 2014; Mechler et al., 2021). Further

alterations have been commonly made to the third criterion to allow for early and late sudden gains to be identified. Kelly et al. (2005) proposed that the gain can be shown if the score is higher than 1.5 standard deviations from the person's mean score over therapy. Hardy et al. (2005) altered the third criterion marginally by suggesting in cases where three sessions before and after the gain were unavailable, two sessions either side of the gain could be used and slightly reduced the *t* value. Although there is room for development in the sudden gain criteria, Shalom and Aderka (2020) argue the need for a consensus to be reached on sudden gain criteria as the differences in measurement of sudden gains can lead to inconsistencies in the literature. The inconsistencies in sudden gain criteria could impact the reporting of sudden gain reversals due to discrepancies in the stability criterion increasing the risk that sudden gains are less stable in less stringent criteria. There is consistency however in the sudden gain reversal criteria, and only one paper has suggested a deviation of this by using the drop by the RCI as opposed to a drop of 50% of gain magnitude (Manning et al., 2010).

Other slight deviations from the initial sudden gain criteria have been applied in the research to allow for the use of other outcome measures. This has been the case when papers have explored sudden gains in the context of disorders other than depression such as post-traumatic stress disorder (PTSD; Sloan et al., 2022), anxiety (Present et al., 2008) and eating disorders (Utzinger et al., 2016). There have also been deviations from the use of the BDI when researching sudden gains in depression for example, the use of the Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001) and the RCI of five with this measure (Masterson et al., 2014). It is unclear how the changes in outcome measures used impacted the prevalence of sudden gains and sudden gain reversals. Aderka et al. (2021) used data from RCTs researching the impact of CBT for depression and evidenced more sudden gains and reversals in the group that completed the Centre for Epidemiological Studies Depression Scale-10 (CESD-10; Andresen et al., 1994) when compared to findings from the PHQ-9

group. Considering the psychometric properties of the BDI-II (Beck et al., 1996) and PHQ-9, both demonstrated similar reliability, convergent validity and showed similarities in responsiveness to change (Titov et al., 2011). Titov et al. (2011) suggested an advantage of the PHQ-9 over the BDI-II due to its length and basis on the diagnostic criteria for depression. The BDI has a stronger focus on the cognitive elements of depression. As sudden gains are reportedly more stable when cognitive change occurs, it could be that the BDI would report less reversals.

Manning et al. (2010) is one of the few papers to explore sudden gain reversals and suggested that client resistance, therapist response, and life events may contribute to the reversal of a sudden gain. Whilst the rate of reversal is regularly reported in the literature, there is a scarcity of rich discussion around sudden gain reversals. To influence such research, the rates of sudden gain reversals need to be established and whether factors influencing their prevalence could impact the process of clients moving from a sudden gain to a superior outcome in therapy.

Rationale

Whilst two previous meta-analyses have drawn together prevalence estimates for sudden gain reversals (Aderka et al., 2012; Shalom & Aderka, 2020), there are challenges in applying these findings to clinical practice. Neither of the previous meta-analyses conducted a quality appraisal which makes it difficult to interpret the overall reliability of the meta-analysis. Shalom and Aderka (2020) pooled the most recent estimate for rate of sudden gain reversal across the sudden gain literature. Whilst this encompassed as many papers as possible from across the literature base, their focus on diverse mental health disorders means that the prevalence may have been influenced by the presentation of participants. Their meta-analysis was inclusive of clients with PTSD, depression, anxiety (social, health and generalised) and panic disorder. Whilst previous meta-analyses have suggested that sudden

gains have similar impacts on outcomes between individuals with anxiety and with depression (Aderka et al., 2012; Shalom & Aderka, 2020), sudden gains in those presenting with diverse disorders had significantly weaker effects on the therapeutic outcome compared to anxiety and depression. Therefore, between presentation differences make it hard to interpret the findings to inform work with patients with specific disorders such as anxiety, or depression. Aderka et al. (2012) did narrow their scope to individuals presenting with anxiety and/or depression, but the field of research has developed since this review and so an update is required.

Objectives

As the literature base has grown over the last ten years and with suggestions that sudden gain and sudden gain reversals prevalence differs across mental health presentations; the present meta-analysis aimed to pool together the prevalence of sudden gain reversals in individuals undergoing psychological therapy for depression. Where information regarding sudden gain reversals was discussed in the literature, the review aimed to provide a narrative summary of this. The review further aimed to explore which study level characteristics impacted the reported rate of sudden gain reversals, accounting for different treatment modalities, sudden gain criteria and depression outcome measures employed. It is hypothesised that sudden gain reversals will be less prevalent in studies where the treatment is either CBT or CT. A second hypothesis is that due to the strict criteria identified in the original Tang and DeRubeis (1999) paper, the rate of sudden gain reversals will be lower in studies that employed these criteria as opposed to an altered version. Studies that used the BDI (any version) are hypothesised to report fewer reversals due to the measure's focus on the cognitive elements of depression and the theory that cognitive change relates to sudden gain maintenance. It was hoped that highlighting the rate of sudden gain reversals would

encourage further research into this phenomenon, influencing ideas around what impacts the stability of a sudden gain and its relationship to superior therapeutic outcomes.

Methods

Search Strategy

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed (Page et al., 2021; See Appendix A). The protocol for this meta-analysis was formally registered on the Prospero database (https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42022344335). A systematic literature search of Scopus, MEDLINE (via OVID 1946 to September 2022), PsycINFO (via OVID 1806 to September 2022), CINAHL (via EBSCO 1981 to September 2022) and Web of Science were initially conducted. The search protocol was repeated on 26th February 2023 to account for any papers published since the initial searches. Bramer et al. (2018) found that inclusion of PsycINFO and CINAHL tended to add unique references to reviews whilst MEDLINE and Web of Science performed well in capturing relevant papers.

The population, intervention, comparison, and outcome (PICO) framework informed the search strategy (Methley et al., 2014). Following preliminary searches and piloting of different search criteria, studies that reported on the sudden gain phenomenon (key word: "Sudden gain*") and included participants undergoing therapy for depression (key words: depression OR depress*) were selected from the initial database searches. The inclusion of search terms such as "sudden gain reversal" or reversal severely limited the number of potentially relevant papers. Sudden gain reversals are uncommon primary outcomes in sudden gain research and so the term is often excluded from the title, abstract or keywords. Still, the prevalence of sudden gain reversals is regularly reported in the body of the paper. Hence, removing terms related to sudden gain reversals from the search strategy produced

more papers relevant to this review. Grey literature was searched via ProQuest and backward citation searching was conducted as per best-practice guidelines (Aguinis et al., 2011).

Study Selection

All 961 papers derived from the searches were exported to the desktop reference manager software MENDELEY (version 1.19.8). Duplicates were automatically removed. The remaining 466 papers titles, abstracts, and key words were screened for relevance to this meta-analysis. The lead researcher (CN) reviewed the full text of the remaining papers against the eligibility criteria as depicted in Table 1 using a bespoke screening and selection tool (see Appendix B).

Approximately a quarter of the papers included for full-text review (k=17) were randomly chosen and assessed against eligibility criteria by an independent researcher (HM). Interrater agreement of 94.2% regarding eligibility for inclusion was found. Discussions regarding discrepancies were had until 100% agreement was reached. Of the 66 full texts reviewed, 43 failed to meet inclusion criteria leaving a final 23 studies for inclusion in the narrative review. Following this, a further study was not eligible for quantitative synthesis leaving 22 studies included for meta-analysis (see Appendix C for justifications for exclusion). Figure 1 provides a summary of study selection.

Data Extraction

The lead author (CN) extracted data independently using a bespoke data extraction table (see Appendix D). Extracted study characteristics included the author(s), publication year, country of study, study design, sample size, therapeutic modality, treatment setting, depression outcome measure used, sudden gain criteria used, number of sudden gainers, median sudden gain session, number of sudden gain reversers, and number of re-gainers after a sudden gain reversal (where reported). The number of sudden gainers and sudden gain reversers were required to provide the proportions needed to compute the pooled prevalence.

Missing data was not imputed, and analysis was only conducted on available data. If data was missing to the extent at which the paper could not contribute to the overall research aims, it was excluded. Data from six of the 22 included studies in the quantitative synthesis (approximately 25%) was additionally extracted by a peer trainee clinical psychologist (HM). The two extractions were compared to ensure accuracy and reliably of the data extraction tool. Interrater reliability of 100% was reached.

Table 1

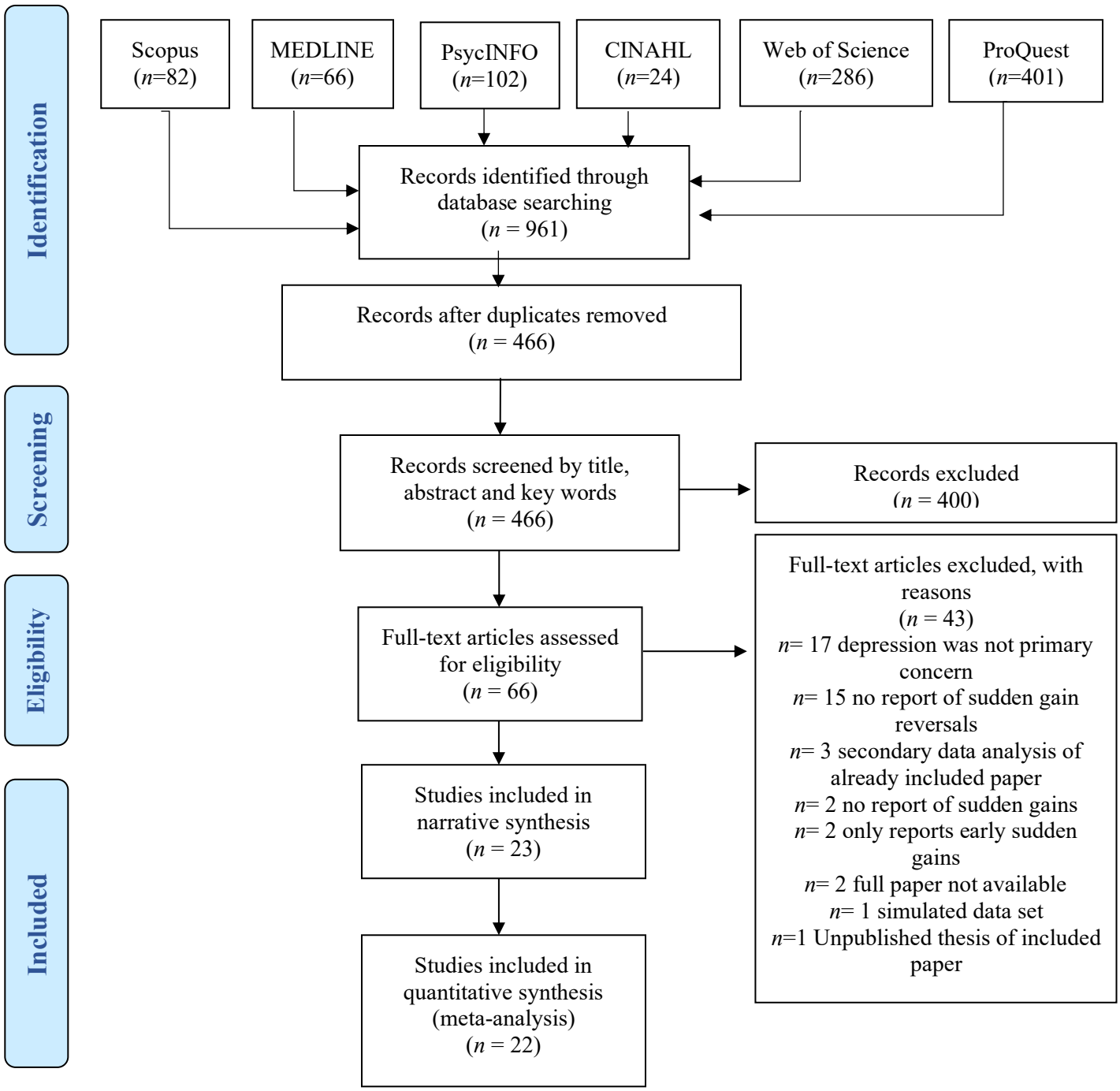
Eligibility Criteria

	Inclusion	Exclusion
Sample	The sample had a primary mental health concern of depression, including those with comorbid conditions and were of any age.	Primary mental health concern was not depression.
Phenomenon	Must have reported sudden gains using any criterion established in the literature (e.g., Kelly et al., 2005; Tang & DeRubeis, 1999). Must have reported rate of sudden gain reversals as defined by Tang and DeRubeis (1999) criterion.	Other sudden gain reversal criteria used. Reported on sudden losses only, not sudden gain reversals. Studies researched early gains as opposed to sudden gains.
Intervention	Any psychological therapy aimed at reducing individuals' experience of depression regardless of duration, frequency of sessions and delivery method.	Non-psychological therapy, including medical interventions. Intervention aimed at reducing symptoms not related to depression.
Outcomes measure	Administered a measure of depression sessional or at least every two sessions to allow for identification of sudden gains and reversals.	Reported on pre-post measures only. No depression outcome measure was administered. The measure was administered less than the minimum of every two sessions.

Design	Studies quantitatively reported the prevalence of sudden gains and sudden gain reversals.	Solely qualitative research design. No quantitative report of sudden gain reversal. The design was a meta-analysis, systematic reviews, or case study.
Availability	Must be published in English. The full research paper must be available. Unpublished studies. Published post 1999 when the sudden gain criterion was first established.	The paper was not published in English. The full-text paper was not available. Paper published prior to 1999.

Figure 1

PRISMA Diagram.



Quality Appraisal

Quality appraisal is an essential undertaking in meta-analyses (Dreier, 2013). The lead author (CN) conducted initial quality appraisal independently using the Effective Public Health Practice Project Quality Assessment Tool (EPHPP; Thomas et al., 2004; See

Appendix E). This tool assesses quality based on selection bias, study design, confounders, blinding, data collection methods and withdrawals and drop-outs. Consideration is also given to intervention integrity and analyses. Each of the six initial components is individually rated as either strong, moderate, or weak. A global rating is then considered for each paper. Strong papers included no weak components, papers with one component rated as weak were defined as moderate quality and an overall weak rating was assigned to papers with two or more weak components. In cases where the included papers employed secondary data analysis, the design of the primary paper in which the data was derived guided the quality appraisal. If the secondary paper did not report on key aspects relevant to domains of the quality appraisal tool, then the primary paper was searched.

Approximately 30% (k=7) of included studies were quality appraised using the same tool by a peer researcher (HM). Quality appraisal is recommended to be completed by two individuals due to the degree of subjectivity in quality appraisal tools and to improve the quality of the review (Harrison et al., 2017). Any disagreements in quality appraisal were resolved by discussion between the two researchers. Inter-rater reliability was derived using Cohen's Kappa Coefficient (Cohen, 1960). The overall quality of the current meta-analysis was evaluated using the AMSTAR-2 tool (Shea et al., 2017). The AMSTAR-2 does not provide a score to indicate quality but instead offers areas of interpretation as to whether the review has critical areas of strengths and weaknesses. The AMSTAR-2 was chosen due to its ability to appraise reviews of randomised and non-randomised papers.

Meta-analytic Strategy

Analysis was conducted using the MetaXL software version 5.3 (Barendregt & Doi, 2016) which supports meta-analysis of binary data. This meta-analysis was primarily interested in the proportion of individuals who experienced a sudden gain reversal following a sudden gain. Proportional data is expected to vary due to population characteristics (Saha et

al., 2008). Hence, proportions were synthesised through a random-effects meta-analysis with studies being weighed using the Freeman-Turkey (double arcsine) transformation rather than an inverse variance method which assigns more weight unjustifiably to studies reporting prevalence that falls towards either the higher or lower limits of zero and one (Barendregt et al., 2013). The prevalence of sudden gain reversals will be reported as a percentage.

Heterogeneity

As this meta-analysis included studies that employed different experimental designs, outcome measures, samples, and interventions, it was important to account for between-study variance (τ^2). High levels of variance supported the use of moderation analysis. The *Q*-statistic and the I^2 statistic were used to explore the between study heterogeneity. The *Q*-statistic is dependent on the number of studies included in the meta-analysis, with smaller study numbers increasing the risk of erroneously assuming homogeneity (Higgins et al., 2003). Conversely, the I^2 statistic is not dependant on the number of studies and is a measure of true between-study variation. Deeks et al. (2022) defined that an I^2 less than 40% may not be important, 30-60% indicates moderate heterogeneity, 50% to 90% denotes substantial heterogeneity and 75% or over represents large heterogeneity. Heterogeneity was expected to be high as is common in proportional meta-analysis due to papers reporting prevalence in different contexts (Barker et al., 2021). Prediction intervals were calculated on Comprehensive Meta-Analysis Version 4 (Borenstein et al., 2022) to provide the range of expected sudden gain reversals across treatment settings as recommended alongside confidence intervals in proportional meta-analysis (Migliavaca et al., 2022).

Moderator Analysis

Moderator variables of the prevalence of sudden gain reversals were specified *a priori* and ran where significant heterogeneity was present. These were determined based on variables explored in the existing literature around the predictors of sudden gains. Categorical

moderators included: therapeutic modality, sudden gain criteria applied, and depression outcome measure used. Subgroup analysis was performed when ten or more studies were included for moderator analysis and the subgroups constituted three or more studies (Card, 2012). Subgroups were deemed significantly different to one another if their confidence intervals did not overlap, as demonstrated in other prevalence meta-analyses (Jadambaa et al., 2019).

Therapeutic modalities were coded as either CBT, CT, behavioural activation (BA) or other. CBT, CT and BA were separated in this study to understand if the cognitive processes alone impacted the sudden gain reversal rate as suggested in the upward spiral theory. Considering BA, Borkovec et al. (2002) suggested that behavioural interventions can result in changes to all systems maintaining a disorder, including negative cognitions despite the interventions not explicitly focus on cognitive change. CBT differs from a purely cognitive approach aimed at modifying automatic irrational thoughts as it also emphasises behaviour change (Jacobson et al., 1996). CBT, CT and BA were therefore grouped separately to understand if the behaviour modification focus resulted in a differing prevalence of sudden gain reversals to interventions aimed at altering unhelpful cognitions. The category of 'other' represented therapies that did not fit into either CBT, CT or BA and whose intervention was not represented enough in the data to form a separate intervention-specific subgroup.

As sudden gain criteria have been evidenced to vary between studies largely based on the alteration of the third criterion established by Tang and DeRubeis (1999), the criteria were coded as either original criteria or altered criteria. Subgroups for the sessional depression outcome measure were coded as either BDI (which included all versions), PHQ-9, or other.

Sensitivity Analysis

The combination of findings from studies of differing designs is not recommended for meta-analysis exploring intervention effects due to increased risk of bias (Reeves et al., 2022). Whilst this study is not exploring intervention effects, the differing study designs may have some impact on the reported prevalence of sudden gain reversals. Sensitivity analysis was conducted to explore if the findings shift based on the study design employed. The study designs were coded as either practice-based evidence (PBE) or randomised controlled trial (RCT). Where secondary data analysis was applied, the primary research paper design influenced the code. Sensitivity analysis was conducted on RCT papers only.

Publication Bias

Whilst attempts have been made to reduce publication bias by the inclusion of grey literature, it is best practice to assess for publication bias in meta-analyses (Wang, 2018). As this meta-analysis focussed on proportion, the data of interest are not levels of significance and so the bias towards the publication of papers that report significant results is unlikely to impact the included papers (Maulik et al., 2011). Wang (2018) argued that research that found low prevalence was as likely as research reporting high prevalence to be published, hence the use of publication bias modelling tools in proportional meta-analysis is less useful. Publication bias will be assessed qualitatively through visual interpretation of funnel plots as opposed to using tests which were developed for use with comparative data (Barker et al., 2021).

Results

Table 2 provides a breakdown of the characteristics of studies included in the quantitative synthesis.

Table 2

Characteristics of Studies Included in Quantitative Synthesis.

Study name	Year	Study (design)	Location	Intervention (delivery format)	N	Female %	Sudden gainers (N)	Pre-sudden gain session (Mdn)	Sudden gain reversers (%)	Re-gainers (N)	Depression measure	Sudden gain criteria	Treatment setting
Abel et al.	2016	RCT[a]	United Kingdom	CBT	156	73.10%	84	6	25 (30%)		BDI-II	Original	Primary
Aderka et al. - CESD-10	2021	PBE (Observational)	United States	CBT (group)	788	58.30%	97	3	24 (25%)		CESD-10	Altered	Inpatient, outpatient, and community
Aderka et al. – PHQ-9	2021	PBE (Observational)	United States	CBT (group)	726	60.20%	112	3	17 (15%)		PHQ-9	Altered	Inpatient, outpatient, and community
Andrusyna et al.	2007	RCT[a]	United States	BA	57	71.90%	26	4	9 (35%)		BDI	Original	Outpatient
Bisby et al. - CG	2022	RCT[a]	Australia	CBT (therapist guided)	110	74%	22		4 (18%)		PHQ-9	Original	Outpatient

Study name	Year	Study (design)	Location	Intervention (delivery format)	N	Female %	Sudden gainers (N)	Pre-sudden gain session (Mdn)	Sudden gain reversers (%)	Re-gainers (N)	Depression measure	Sudden gain criteria	Treatment setting
Bisby et al. - SG	2022	RCT[a]	Australia	CBT (self-guided)	99		18		1 (6%)		PHQ-9	Original	Outpatient
Busch et al.	2006	PBE[b] (Interventional)	United States	CT and FAP enhanced CT	38	61%	16	10	7 (44%)	8	BDI	Original	Outpatient
Gaynor et al. - CBT	2003	RCT[a]	United States	CBT	32	72%	16		3 (19%)		BDI	Original	Outpatient
Gaynor et al. - NST	2003	RCT[a]	United States	NST	28	75%	11		1 (9%)		BDI	Original	Outpatient
Gaynor et al. - SBFT	2003	RCT[a]	United States	SBFT	27	81%	7		4 (57%)		BDI	Original	Outpatient
Hardy et al.	2005	PBE (observational)	United Kingdom	CT	76	70%	31	5	10 (32%)	6	BDI-II	Altered	Primary and secondary care
Hopko et al.	2009	PBE[b] (Interventional)	United States	BA	26	92.30%	13		4 (31%)	4	BDI-II	Altered	Primary care
Hunnicutt-Ferguson et al.	2012	PBE (Observational)	United States	BA	42	69%	15	1	2 (13%)		QIDS-SR	Altered	Primary care

Study name	Year	Study (design)	Location	Intervention (delivery format)	N	Female %	Sudden gainers (N)	Pre-sudden gain session (Mdn)	Sudden gain reversers (%)	Re-gainers (N)	Depression measure	Sudden gain criteria	Treatment setting
Kelly et al.	2005	PBE (Interventional)	United States	CBT	31	61.30%	13		7 (54%)	4	BDI	Altered	Outpatient
Kelly et al.	2007	PBE[b] (Interventional)	United States	IPT	185	100%	62		33 (53%)		BDI	Altered	Outpatient
Lemmens et al. CT	2016	RCT[a]	Netherlands	CT	64	66.70%	27	9	6 (22%)		BDI	Original	Outpatient
Lemmens et al. IPT	2016	RCT[a]	Netherlands	IPT	53		13	9	2 (15%)		BDI	Original	Outpatient
Masterson et al.	2014	RCT[a]	United Kingdom	BA	40		17	2	2 (12%)		PHQ-9	Altered	Primary care
Mechler et al.	2021	RCT[a]	Sweden	IBPT	66	83%	17		8 (47%)		QIDS-A17-SR	Altered	Internet-based
O'Mahen et al.	2021	RCT[a]	United Kingdom	CBT	300	36%(CBT)	110		28 (25%)		BDI	Altered	Primary care
Ryan	2013	PBE (Observational)	United States	CT	41	56%	24	4	14 (58%)	11	BDI	Altered	Outpatient
Singh et al.	2021	RCT[a]	Canada	Experiential therapy	36	58%	23	9	8 (35%)	4	BDI-SF	Altered	Outpatient

Study name	Year	Study (design)	Location	Intervention (delivery format)	N	Female %	Sudden gainers (N)	Pre-sudden gain session (Mdn)	Sudden gain reversers (%)	Re-gainers (N)	Depression measure	Sudden gain criteria	Treatment setting
Tang & DeRubeis	1999	RCT[a]	United States	CBT	61		24	5	4 (17%)		BDI	Original	Outpatient
Tang et al.	2005	RCT[a]	United States	CBT-AT	37		17	5	5 (29%)		BDI	Original	Outpatient
Tang et al.	2005	RCT[a]	United States	CBT-CT	46		20	8	8 (40%)		BDI	Original	Outpatient
Tang et al.	2007	RCT[a]	United States	CT	60		24	5	9 (38%)		BDI	Original	Outpatient
Tang et al.	2002	PBE[b] (Interventional)	United States	SE	35		15	5	7 (47%)		BDI	Original	Outpatient
Vittengl et al.	2005	RCT[a]	United States	Acute CT	227		95	4	18 (19%)		BDI	Original	Outpatient

[a] Secondary data analysis of randomised controlled trial (RCT) [b] Secondary data analysis of practice-based evidence (PBE)

Note. CBT= cognitive behaviour therapy; BA= behavioural activation; CT= cognitive therapy; FAP= functional analytic psychotherapy; NST= non-directive supportive therapy; SBFT= systemic behavioural family therapy; IPT= interpersonal therapy; IBPT= Internet based psychodynamic therapy; CBT-AT= cognitive behaviour therapy -automatic thought; CBT-CT= cognitive behaviour therapy-cognitive therapy; SE= supportive-expressive; BDI= Beck Depression Inventory; BDI-II= Beck Depression Inventory – second edition; CESD-10= Center for the Epidemiological Studies of Depression-10; PHQ-9= Patient Health Questionnaire-9; QIDS-SR= Quick Inventory of Depressive Symptomatology-Self Rated; QIDS-A17-SR= Quick Inventory of Depressive Symptomatology for Adolescents-Self Rated; BDI-SF= Beck Depression Inventory – Short Form.

Study Characteristics

Of the 23 included papers, 21 were peer-reviewed and published in academic journals with two studies from grey literature. Manning et al. (2010) was included for narrative synthesis due to being core to sudden gain reversal literature and was excluded from meta-synthesis as the dataset was represented in Hardy et al. (2005). Most studies (*k*= 13) conducted secondary data analysis of previous RCTs, *k*=5 conducted secondary data analysis using data collected in non RCT studies and *k*= 5 used practice-based evidence. Two studies (Tang et al., 2005; Andrusyna et al., 2007) used data from the same three-armed RCT however they used data from different arms allowing both to be included for analysis. Of the 3021 participants whose gender was reported in the study, 60% were female.

Most (68%) studies were conducted in outpatient treatment settings with 27% including patients treated in primary care settings and 5% treated participants via the internet. Two studies included participants aged under 18. Most studies took place in the United States (64%) or the United Kingdom (18%), with Australia, Sweden, Canada and the Netherlands represented by one study each. The number of participants in each study ranged from 28 to 788 with a combined sample size of 4,137.

Intervention Characteristics

Interventions offered were commonly CBT (36%), CT (27%), BA (23%) and interpersonal therapy (IPT; 9%). Supportive-expressive was administered in two studies whilst psychodynamic therapy, experiential therapy, and systemic behavioural family therapy were each represented once. One study delivered CBT via a group format, one employed self-directed CBT and *k*= 7 delivered therapist directed individual CBT. Concerning CT**,** one paper reported the acute phase of CT and another enhanced CT combining functional analytic psychotherapy techniques.

Sudden Gain Characteristics

The original sudden gain criteria defined by Tang and DeRubeis (1999) was altered in *k*=11 of the studies included for quantitative synthesis. Dropping the criterion of a 7 or more-point reduction on the BDI, *k*=5 studies used the reliable change criterion to establish symptom improvement. Replacing the original third criterion some studies reduced the requirement for three session outcomes either side of the gain and interpreted the significance of the *t* value (*k*=4) whilst others defined the need for change to be 1.5 standard deviations larger than the individuals mean (*k*=5).

The meta-analysis included 969 sudden gainers (27.8% of included sample). Where papers reported the median pre-gain session (*k*=15), the most common pre-gain session was session five. The percentage of sudden gain reversals in each arm of the included studies ranged from 6% to 58% and a total of 270 sudden gainers reversed. The number of people who regained was reported in six studies and the number of regainers ranged from four to 11.

Considering the sessional depression measures employed, *k*=17 used a version of the BDI with *k*=3 employing the BDI-II and *k*=1 using the BDI-short form. Other measures include the PHQ-9 (*k*=3), the Centre for Epidemiologic Studies Depression scale-10 (*k*=1) and versions of the Quick Inventory of Depression Scale (*k*=2).

Methodological Quality

Overall, eight of the 23 included papers were established as weak quality papers. A further ten were deemed to be moderate quality and five papers were strong (see Appendix F for a breakdown of quality appraisal). In quantitative synthesis where one paper was not included, seven papers were deemed weak quality. An area that was consistently rated high in risk of bias (RoB) was the selection processes. Many papers (k=7) recruited participants via referral from treatment clinics and three papers recruited via self-referral. This increased the likelihood of participants not meeting the studies' inclusion criteria and attracting individuals who are less representative of the population. There were papers that failed to report relevant

statistics to allow for appraisal in certain areas contributing to a weak rating (k=12). Often this was in the reporting of selection processes (k=7) and attrition rates throughout the study journey (k=5). Blinding processes were often not appropriate to the design, not reported or unclear hence, most papers (k=20) were rated as moderate on this component. Low RoB was evident in the data collection method with all papers receiving a strong rating related their use of reliable and valid outcome measures. Inter-rater agreement was moderate Cohen's Kappa =0.42 and discussions were had until 100% agreement was reached.

The AMSTAR-2 suggested this meta-analysis has strengths in the research question and inclusion criteria which were included in the published protocol (see Appendix G). Quality may have been impacted by the inclusion of both RCT and PBE, although this has been considered and analysis conducted to explore the impact of including both designs.

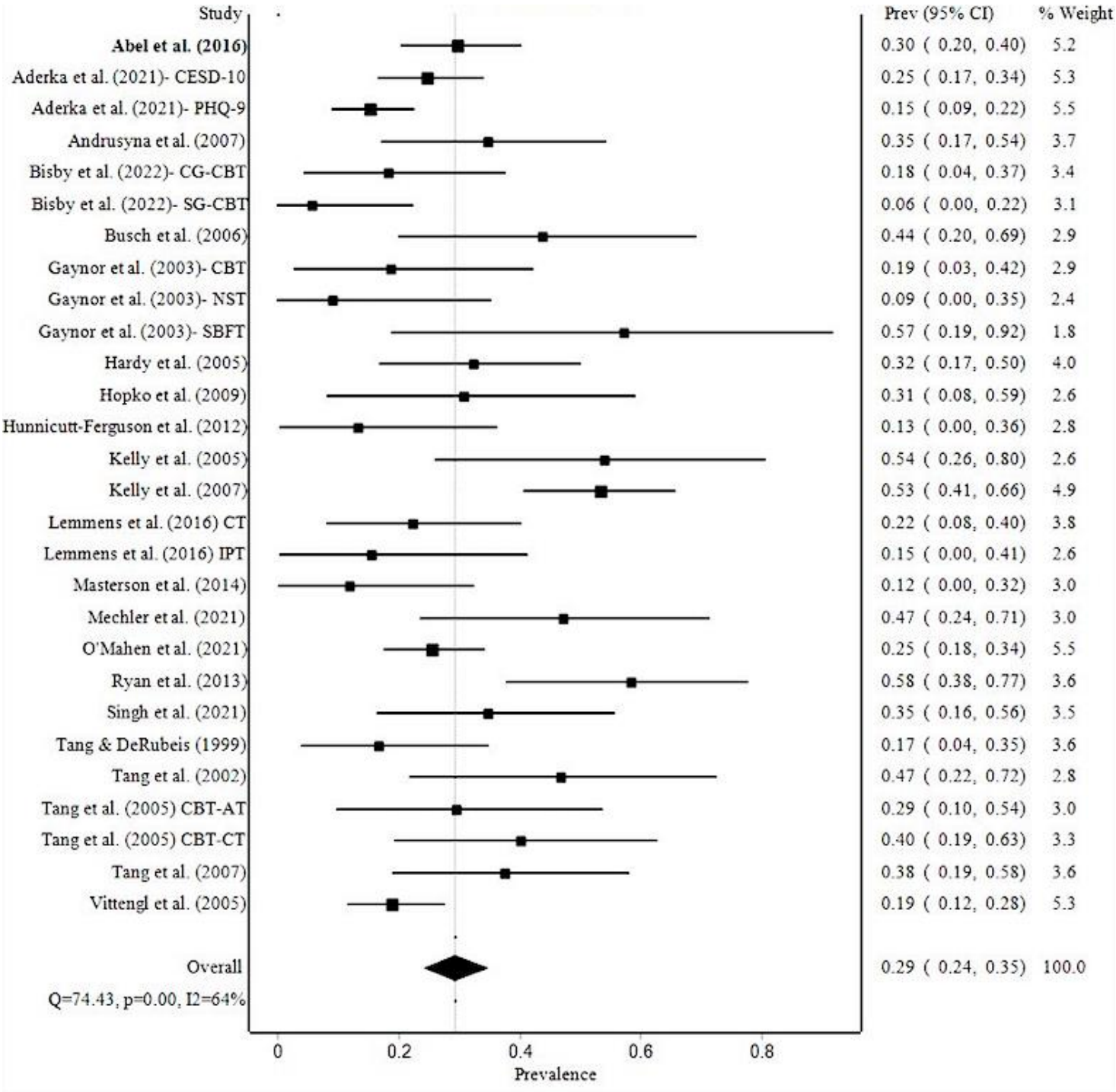
Meta-analysis Results

Sudden Gain Reversal Prevalence

The meta-analysis combined data from 3487 participants from 22 studies encompassing 28 independent samples. The pooling of prevalence data from across the sudden gains literature which reported the rate of sudden gain reversals suggested that 29% (Figure 2; 95% confidence intervals [CIs] 0.24 to 0.35) of sudden gains are reversed. There was significant heterogeneity evident ($Q(27)= 74.43$, $p<.001$) which was estimated to be in the moderate to substantial range ($I^2= 64\%$). The prediction interval for sudden gain reversal prevalence ranged between 12.4% and 55.6% at 95% confidence.

Figure 2

Forest Plot for Prevalence of Sudden Gain Reversals in Sudden Gainers Undergoing Treatment for Depression.



Moderator Analysis

Therapeutic Intervention

Figure 3 provides a breakdown of subgroup analysis by intervention. The CBT subgroup (k=11) had a pooled reversal prevalence of 24% (95% CI [0.19 to 0.30]) and showed significant moderate heterogeneity between the samples ($Q(10)$=19.94, p<.05; I^2=50%). In studies reporting sudden gain reversals in BA (k=4) the pooled prevalence was also 24% (95% CI [0.13 to 0.36]) with insignificant and unimportant levels of heterogeneity found ($Q(3)$= 3.96, p=.27; I^2=24%). The CT subgroup experienced a sudden gain reversal rate of 34% (95% CI [0.22 to 0.47]). There was significant and substantial heterogeneity present in the CT subgroup ($Q(5)$= 16.86, p<.001; I^2=70%). Higher rates of sudden gain reversals were reported for those who underwent therapies other than CBT, CT, and BA where 38% of sudden gainers (95% CI [0.26 to 0.52]) experienced a reversal. Moderate heterogeneity was estimated ($Q(6)$= 14.06, p=.03; I^2=45%). Overlapping confidence intervals would suggest differences between the subgroups were non-significant.

Sudden Gain Criteria

All data sets were included for subgroup analysis based on the category of sudden gain criteria applied. Papers using the original three Tang and DeRubeis (1999) criteria (k=16) reported that 27% (95% CI [0.21 to 0.33]) of all sudden gains identified by these criteria were reversed. Moderate significant heterogeneity was present ($Q(15)$= 24.96, p=.05; I^2=40%). Prevalence of sudden gain reversals in papers using altered sudden gain criteria (k=12) was higher than the original criteria and was found to be 32% (95% CI [0.24 to 0.42]) with significantly large heterogeneity indicated ($Q(11)$= 48.45, p<.01; I^2= 77%). The overlapping confidence intervals would suggest the differences between prevalence in the subgroups was not significant. Figure 4 displays the forest plot for subgroup analysis by sudden gain criteria.

Figure 3

Forest Plot for Subgroup Analyses of Intervention as a Moderator of Sudden Gain Reversals

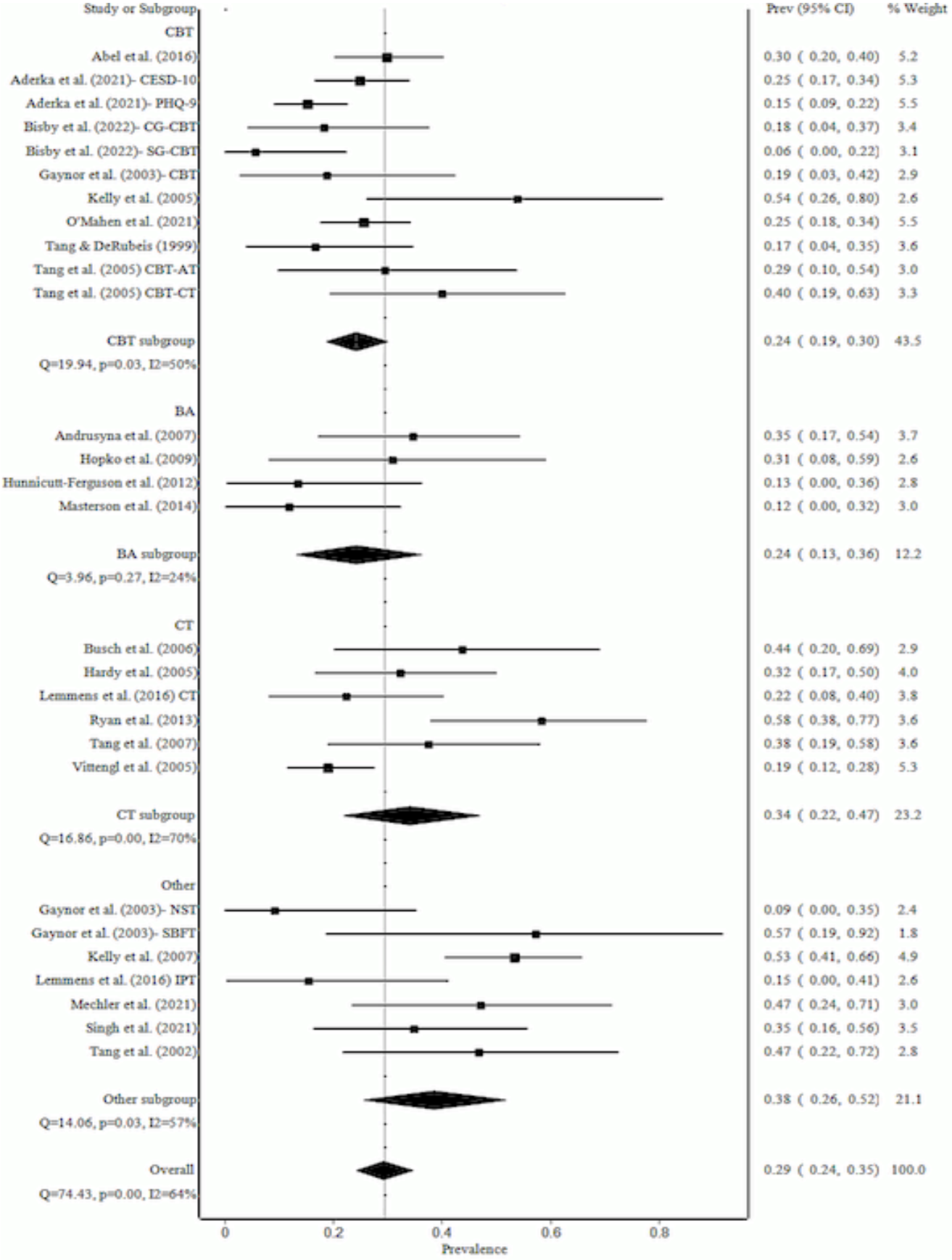
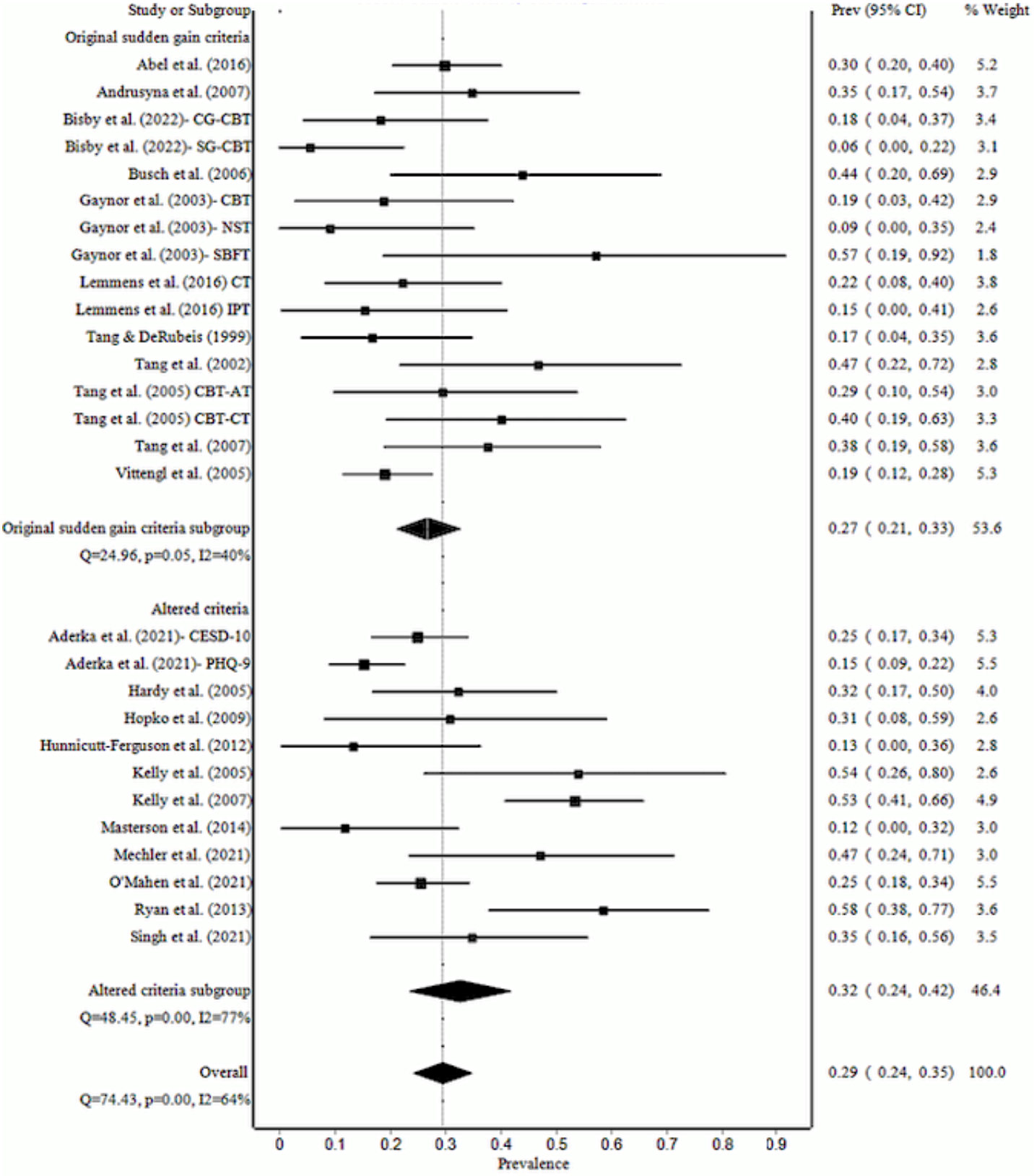


Figure 4

Forest Plot for Subgroup Analysis of Sudden Gain Criterion as a Moderator of Sudden Gain Reversal Rates.

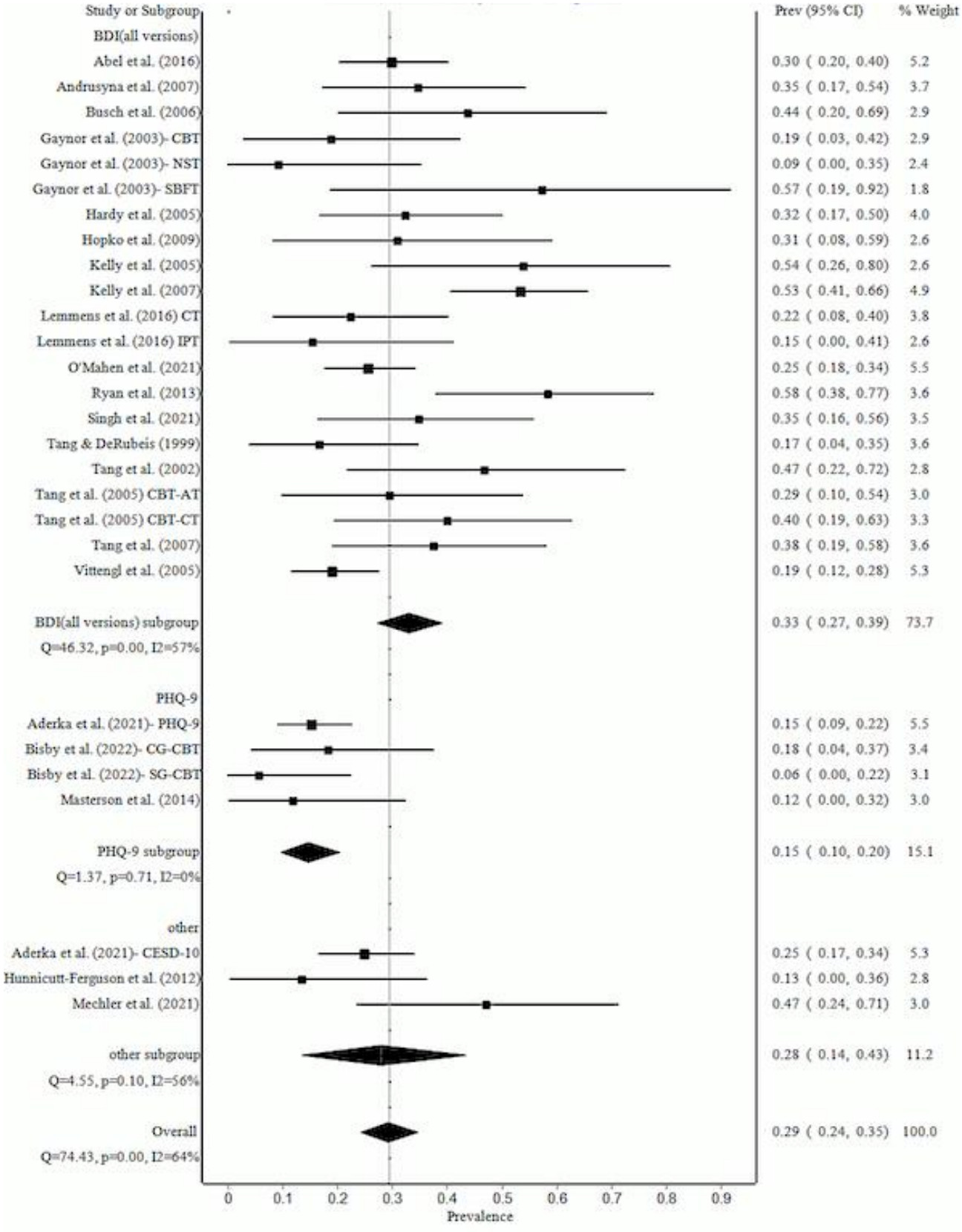


Measure of Depression

Measures of depression subgroup analysis included all datasets of the meta-analysis (see Figure 5). The most employed measure in the sudden gain literature was the BDI (all versions included) and comprised of k=21 data sets. The prevalence of sudden gain reversals within the BDI (all versions) group was 33% (95% CI [0.27 to 0.39]) and significant moderate heterogeneity was reported ($Q(20)$= 46.32, p<0.01; I^2= 57%). The PHQ-9 group (k=4) showed that 15% (95% CI [0.10 to 0.20]) of sudden gainers experienced a reversal, indicating that papers using the PHQ-9 measure reported less reversals than papers that used the BDI. Heterogeneity within the PHQ-9 group was found to be insignificant ($Q(3)$= 1.37, p=.71; I^2= 0%). The final group reported that in studies that employed measures other than the BDI and the PHQ-9, prevalence of sudden gain reversals was 28% (95% CI [0.24-0.35]) and moderate heterogeneity was estimated ($Q(2)$= 4.55, p=.10; I^2= 56%). As the confidence intervals between the PHQ-9 subgroup and BDI subgroup do not overlap, the difference between these groups is interpreted as significant.

Figure 5

Forest Plot for Subgroup Analysis of Sessional Depression Measures as a Moderator of Sudden Gain Reversal Rates.

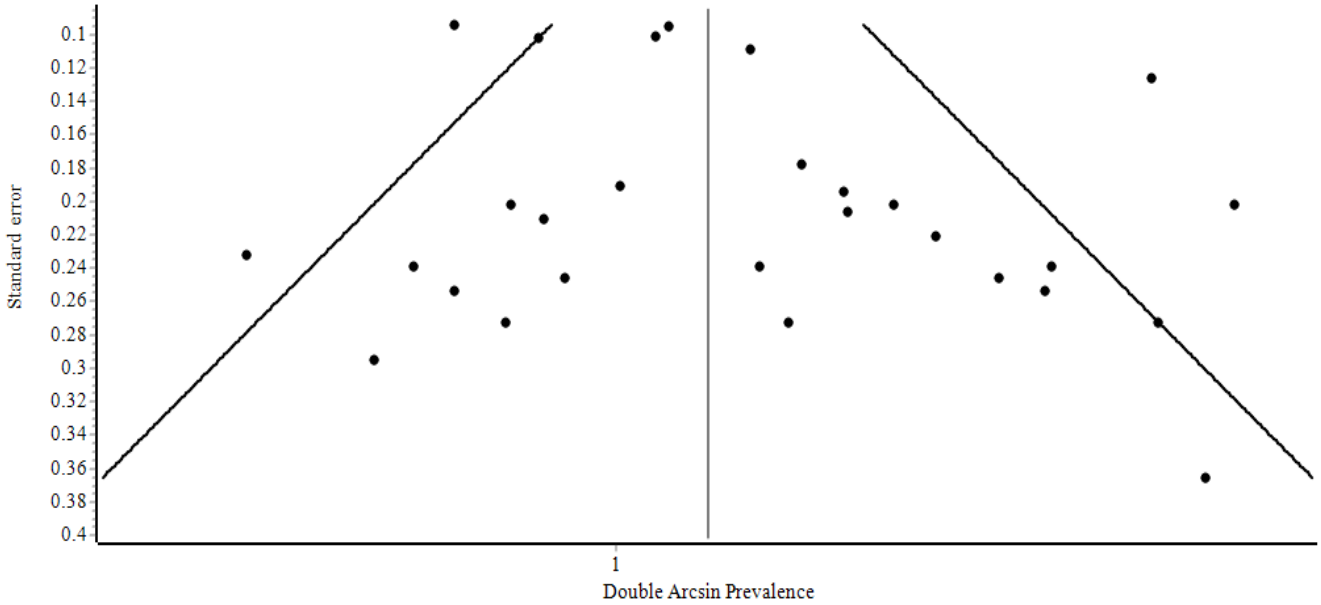


Publication Bias

Visual interpretation of the funnel plot (figure 6) shows a relatively symmetrical pattern around the summary effect suggesting unlikely evidence of reporting bias.

Figure 6

Funnel Plot for Interpretation of Publication Bias.



Sensitivity Analysis

To interpret the robustness of findings considering the decision to combine results from RCTs and other quantitative designs, sensitivity analysis was run removing any papers that were not RCTs. Following exclusion of non RCT data sets, the pooled prevalence of sudden gain reversals lowered to 26% (95% CI [0.21-0.31]) and heterogeneity was moderate ($Q(17)$=25.66, p=.08; I^2= 34%). The predictive interval ranged from 15.9% to 42.7%. Removal of the 10 data sets based on non RCT data reduced the heterogeneity present in the review suggesting the initial inclusion of RCT and non RCT studies produced methodological heterogeneity.

Narrative Synthesis of Factors Impacting Rate of Reversals

Rates of sudden gain reversal were often reported as sudden gain descriptive statistics in the literature and many papers neglected to further explore variables impacting the rate of

reversals. One paper aimed to explore sudden gain reversals in the first instance. Manning et al. (2010) report that sudden gain reversals were not related to life-events and that the nature of reversals were fluid, with participants often recovering their gain by the end of therapy. Of the participants who experienced reversals, at least 50% were found to have regained by the end of therapy in the six papers that reported re-gain statistics with 100% of the sudden gain reversers regaining by the end of therapy in two of these papers (Hopko et al., 2009; Hunnicutt-Ferguson et al., 2012). Five studies suggested that rate of reversal was impacted by the intervention, with IPT, supportive-expressive and family therapy producing less stable sudden gains compared to CT, CBT, and BA. Other factors hypothesised as impacting the rate of reversals were thought to be timing of the sudden gain in therapy (Mechler et al., 2021; Singh et al., 2021) expertise of the therapist (Ryan, 2013), the treatment setting (Bisby et al., 2022; Ryan, 2013), study design (Hardy et al., 2005) and sudden gain criterion used (Kelly et al., 2005).

Discussion

Sudden gain reversals in the context of psychological therapies have been under-researched despite sudden gain research regularly reporting sudden gain reversals occurring in psychological therapy. This review aimed to understand the prevalence of sudden gain reversals in psychological therapy for depression and the variables that impact the prevalence of this phenomenon to support research into mechanisms related to sustained sudden gains. This meta-analysis reports a pooled prevalence rate of 29% for sudden gain reversals during treatment for depression. Shalom and Aderka (2020) suggested an average reversal rate of 34.9% across the sudden gain literature, approximately 6% higher than the findings in this review. This suggests that the rate of sudden gain reversals in those undergoing therapy for depression is lower than the rate reported for all mental health presentations combined.

Due to the natural fluctuations of depressive symptoms in individuals with depression it could be expected that they would experience more frequent sudden gain reversals. It was theorised in Aderka and Shalom's (2021) recent publication that sudden gains would be more prevalent in fluctuating disorders such as depression and that the occurrence of sudden gains outside of therapy were more likely to be reversed. This review supports that sudden gains occurring during the attendance of therapy for depression are likely to lead to sustained positive change for most clients with less frequent sudden gain reversals.

Supposing the upward spiral is the link between sudden gains and maintenance of this gain to achieve a superior outcome, it was hypothesised that there would be less reversals in CT compared to other subgroups. Interventions not categorised in the cognitive and/or behavioural domain in which cognitive change is not the primary aim of the intervention reported the highest rate of sudden gain reversals. This is in line with the evidence base as papers exploring therapies such as experiential therapy suggest that the gains made in these therapies are less stable than those reported in cognitive based therapies (Tang et al., 2002). Unexpectedly, high rates of sudden gain reversals were recorded for studies that employed CT. This finding could be due to the substantial levels of heterogeneity found between the papers in the CT group having an important impact on the pooled prevalence of sudden gain reversals. In support of this finding, Lemmens et al. (2016) reported that a higher percentage of the CT group had a sudden gain reversal than the IPT group. Papers researching sudden gains in CBT and BA had lower rates of sudden gain reversals which could be suggestive of a link between behavioural change and maintenance of the sudden gain. Supporting this, Lemmens et al. (2021) explored what clients who had experienced a sudden gain attributed the gain to in the post-gain sessions. The largest between-session changes were observed at the post-gain session with there being the biggest change in the behavioural domain. It could be argued that whilst there is a behavioural change element linked to less sudden gain

reversals, the behavioural change may have been achieved through the mechanism of cognitive change (Lorenzo-Luaces et al., 2015) supporting the upward spiral theory linking sudden gains to stable gains and superior outcomes.

The discrepancies between the sudden gain identification criteria employed across papers has previously resulted in other meta-analyses calling for more standardisation in the identification of sudden gains due to the impacts on the interpretation of findings across the literature (Shalom & Aderka, 2020). The subgroup in this review that employed the original Tang and DeRubeis (1999) criteria had a 5% lower prevalence of sudden gain reversals than the subgroup of papers that employed an altered criteria for sudden gains. Larger heterogeneity was found and expected in the altered criteria subgroup due to the alterations of the criteria being different across papers in this group. This subgroup analysis suggests that the sudden gain criteria employed impacts the rate of reversals, despite the criteria used to define a sudden gain reversal remaining consistent across all the included papers. Secondly, it could be inferred that the stability criterion (third criterion) in the original three criteria leads to the identification of sudden gains that are more likely to remain stable. The differences in sudden gain criteria employed across the literature could be contributing to inconsistencies in study findings making it difficult to interpret results and inform clinical practice.

Opposite to what was hypothesised, a significant difference in sudden gain reversal prevalence was observed between studies that used the PHQ-9 as their sessional outcome measure and studies that administered the BDI. The PHQ-9 subgroup had insignificant heterogeneity and had almost half the rate of sudden gain reversals than the other subgroups. The impact of outcome measure used has not been reported in previous meta-analyses, but one included study compared the use of the PHQ-9 to the CESD-10 when understanding predictors of sudden gains (Aderka et al., 2021). This study reported that although both outcome measures identified sudden gains that significantly predicted better outcomes, the

sudden gainers in the PHQ-9 group had around a 10% lower rate of reversals than the CESD-10 group. This meta-analysis draws a tenuous link between the PHQ-9 and identification of more stable sudden gains. Taking into consideration the papers included in the PHQ-9 subgroup, all researched either CBT or BA which were previously shown in this analysis to report lower levels of sudden gain reversals. It may be that the insignificant heterogeneity is linked to more consistency in the papers due to the similar interventions employed in the subgroup. The BDI places more emphasis on the cognitive elements of depression, in line with the findings that CBT and BA had lower levels of reversals, the differences in reversal rates across the PHQ-9 and BDI could further support the argument that behavioural change is linked with sudden gain maintenance.

Considering the contributions made to the narrative synthesis summarising existing findings related to sudden gain reversals, there was very little substance in the included papers. The area of sudden gain reversals has been under researched with a heavier focus on predictors of sudden gains. As the research into predictors of sudden gains is proving inconsistent (Aderka & Shalom, 2021), a more viable area of research may be around the factors leading to the maintenance of sudden gains leading to superior outcomes. On this basis, sudden gain reversals research would allow more to be understood about what factors impact the loss of sudden gains and areas of intervention to support their maintenance.

Strengths and limitations

This review includes six papers not previously summarised in other reviews. Hence, this analysis provides a valuable update to the existing literature. Of the papers included, there were examples of unpublished grey literature which reduces the risk of publication bias impacting the findings. Furthermore, the use of the quality appraisal is an added strength to this meta-analysis where Shalom and Aderka (2020) did not quality appraise included papers.

The majority of the included papers (k=17) employed secondary data analysis of RCT's and non RCT's. Quality appraisal of such research designs are unclear to administer due to the data set being collected by a primary research paper. In these cases, the quality appraisal tool was chosen based on the design of the paper in which the original data was collected and where data was not available in the secondary research, the primary paper was searched for and used. Whilst this does appraise the methodology in which the data was collected, it does not account for the methodology employed by the secondary study. Attempts to provide a guideline for assessing the quality of and reporting of secondary data analysis research have been made by Swart et al. (2016) via the STROSA checklist. However, this checklist was designed with German research practices in mind, and it is unclear how generalisable this is to non-German research. Whilst the quality appraisal tool employed was the best fit for the included research, more design specific tools could have allowed for more design specific areas of the research to be appraised and interpreted.

The decision to include both RCT and non-RCT data in the quantitative synthesis was made to include as many relevant papers as possible. Supporting this decision, previous meta-analyses in sudden gain literature have also pooled together findings from papers employing varied quantitative designs (Aderka et al., 2012; Shalom & Aderka, 2020). The sensitivity analysis concluded that the methodological diversity across the included papers contributed to substantial heterogeneity in the findings. It may have been more appropriate to make use of papers only reporting RCT data to reduce presence of heterogeneity. However, this could result in the findings being less relatable to the day-to-day practice of clinicians on the ground and less applicable to less controlled clinical environments. In support of this, Hardy et al. (2005) suggested that the stability of sudden gains was likely impacted by whether the research was a clinical trial which was more controlled than routine practice. Despite this, the differences in the prevalence of sudden gain reversals were only marginally lower when non-

RCT data was removed, suggesting that the design differences had little impact on the reporting of sudden gain reversals.

A further limitation is that this analysis did not account for differences across participant characteristics such as age despite there being papers that included adult and children's populations. Subgroup analysis to explore the impact of participants' age was a possibility, however as there were only two included studies whose participants were under the age of 18, this would not have met the minimum three papers per subgroup outlined as best practice by Card (2012). Whilst the pooling of data from a range of ages could have impacted the overall prevalence reported, Aderka and Shalom (2020) found that the effects of sudden gains were no different between adults and children and so it was hypothesised that the prevalence would also not be impacted by this.

Subgroups were deemed significantly different to one another if the confidence intervals did not overlap. This method of interpreting significant differences has been shown to increase the risk of type one errors when a 95% confidence interval was used (Knol et al., 2011). When subgroup analysis was repeated at Knol et al.'s (2011) recommended 83.4% confidence interval level to reduce the risk of type one errors, no further significant difference was found suggesting that the interpretation of significant differences at the 95% confidence interval used in this study did not produce a type one error.

Future Recommendations

This review brings attention to sudden gain reversals within the sudden gain literature as a valuable topic that could inform research into the maintenance of sudden gains. Moving forward, it would be of interest to look at the effect of sudden gain reversals on the relationship between sudden gain occurrence and overall outcome from psychological therapy. Shalom and Aderka (2020) found that sudden gain reversals significantly moderated the effect between sudden gains and superior outcomes, but their meta-analysis pooled the

findings from a range of mental health presentations. This study has highlighted that there is a slightly lower rate of sudden gain reversals in sudden gainers undergoing therapy for depression and so it is recommended that future studies explore if the occurrence of a sudden gain reversal moderates the impact of sudden gains on patient outcomes in depression only.

The return to sudden gain session score after a sudden gain reversal (deemed a regain) is of interest as this would inform whether a sudden gain reversal hinders outcomes or whether they are often temporary changes during the process of therapy. Regains of sudden gains were reported in some papers but the definition applied by researchers to identify regains varied and so it is difficult to pool together reliable frequencies as it is unclear if all papers are truly measuring regains.

The current review would echo a previous meta-analysis (Shalom & Aderka, 2020) and call for more standardisation in the criteria used to identify sudden gains in the literature. The discrepancies in criteria may be contributing to inconsistent findings in the literature base making it increasingly difficult to draw reliable conclusions about sudden gains and their stability.

Clinical and Research Implications

This meta-analysis obtained data from both practice-based evidence and clinical trials with the aim of these findings being applicable to routine clinical practice. The exploration of sudden gain reversals allows for interpretation of variables that may be important to the maintenance of a sudden gain leading to superior outcomes. Future research could further consider variables influencing the stability of sudden gains. This review highlights the increased prevalence of sudden gain reversals across different therapies. Clinicians delivering therapies such as CT and non-behavioural focussed therapies could benefit from being mindful of possible reversals and work with the client to observe changes in outcomes and

discuss mechanisms that could support their maintenance of the sudden gain prior to reversals.

Conclusion

Around three in ten individuals (29%) experience a reversal of their sudden gain made during psychological therapy for treatment of depression. This finding highlights that sudden gains sometimes fail to instigate an upward spiral and that more research is needed to understand how individuals maintain a sudden gain, and benefit from superior outcomes in therapy. Variables that potentially impact the prevalence of sudden gain reversals include: the type of therapy, depression outcome measure employed and the criteria for sudden gains used. There is a need for more consistency in the sudden gain literature around the criteria used to establish sudden gains. As research exploring predictors of sudden gains remains inconclusive, further understanding of how individuals maintain a sudden gain and achieve superior outcomes may be fruitful in providing evidence useful to clinical practice that aids more individuals to keep their sudden gains.

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Appendix A

PRISMA checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Page 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Page 2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Page 8-9
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Page 9
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Page 12-13
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Page 10
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Page 10
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Page 10-13 and Appendix B
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Page 11 and Appendix D
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Page 11 And Appendix D

Section and Topic	Item #	Checklist item	Location where item is reported
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Page 11
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Page 14-15
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Page 15-16
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Page 15-17
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Pages 11 and 15-16
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Pages 15-16
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Page 15-16
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Page 16-17
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Page 17
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Page 18
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Page 15-16
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Page 14. 18 and 19
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Appendix c
Study characteristics	17	Cite each included study and present its characteristics.	Page 20--25
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Appendix F, page

Section and Topic	Item #	Checklist item	Location where item is reported
			26
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Pages 26-32
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Appendix F
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Pages 25-31
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Pages 26-32
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Page 33
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Page 33
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Not complete
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Page 34-37
	23b	Discuss any limitations of the evidence included in the review.	Page 26
	23c	Discuss any limitations of the review processes used.	Pages 37-39
	23d	Discuss implications of the results for practice, policy, and future research.	Page 40-41
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Pages 9-10
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Pages 9-10
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Not complete
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Not applicable

Section and Topic	Item #	Checklist item	Location where item is reported
Competing interests	26	Declare any competing interests of review authors.	Not applicable
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Not applicable

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

For more information, visit: http://www.prisma-statement.org/

Appendix B

Screening and selection tool

Date: Author Name:

Title:

	Inclusion	**Exclusion**
Patient Population	☐ Clinical population of any age ☐ Primary mental health concern of depression	☐ Patients included with other primary diagnosis
Intervention	☐ Psychological therapy to reduce depression	☐ Medical interventions ☐ Non-psychological therapy ☐ Intervention to reduce symptoms other than depression
Outcomes	☐ Sessional (or at least every other session) depression outcome measures administered. ☐ Reported sudden gains (using any established criteria) ☐ Reported rate of sudden gain reversals using Tang and Derubeis (1999) criterion	☐ Pre-post measures only ☐Sessional outcome measures administered but no measure of depression. ☐ Only reporting of early gains ☐ Reporting only of 'sudden loss', not sudden gain reversals
Study Design	☐ Quantitative research designs (except those listed in the exclusion criteria)	☐ Qualitative ☐ Case-studies/ Single-case designs ☐ Meta -analysis and systematic reviews
Overall Decision	☐**Include**	☐**Exclude**

Appendix C

Justification for excluding papers after full text review

First author (date)	Doi	Reason for exclusion
Lorenz et al (2013)	10.1007/s10608-012-9510-3	Duplicate
Deisenhofer (2022)	10.1080/10503307.2021.1921302	Main diagnosis not established, no separate analysis for depression
Zilcha-Mano (2019)	10.1037/ccp0000401	majority of sample had depression but not all participants main diagnosis.
Olthof (2020)	10.1177/2167702619865969	Depression not main diagnosis for all participants
Vittengl (2016)	10.2174/1573400510666140929195441	Simulation data, no raw patient data used
Erekson (2018)	10.1080/10503307.2016.1247217	Depression not main diagnosis for all participants
Shleider (2019)	10.1007/s10578-019-00889-2	Not identifying sudden gains
Marshollek (2021)	10.1007/s00406-021-01285-5	Early sudden gain reported only
Keinonen (2018)	10.1016/j.jcbs.2018.07.010	Early sudden gain reported only

Abel (2014)	No doi	Paper not found
Ietsugo (2015)	10.1007/s12671-014-0358-3	Participants diagnosed with depression, but study measured anxiety and focussed on sudden loss as opposed to sudden gain reversal
Tchitsaz-Stucki (2009)	10.1026/1616-3443.38.1.13	Unavailable in English
Koffman (2018)	10.1002/cpp.2337	Not all participants had a primary diagnosis of depression
Keinonen (2019)	10.1016/j.jcbs.2019.06.006	Did not report reversals and only focussed on early sudden gains
Adler (2012)	10.1037/a0033774	Not all participants had a primary diagnosis of depression
Ehrlich (2015)	10.1007/s00278-015-0019-6	Sudden loss reported not sudden gain reversals.
German (2014)	10.1521/ijct.2014.7.3.272	Same data as DeRubeis (2005)

Schilling (2020)	10.1037/int0000242	Not all participants had a primary diagnosis of depression
Goodridge (2009)	10.1080/10503300802545611	Excluded sudden gainers with reversals
Clapp (2016)	10.1002/da.22534	Participants main diagnosis was PTSD
Wucherpfennig (2017)	10.1037/ccp0000263	Does not use reversal criteria and refers to it as a ‘stable loss’
Yasinski (2020)	10.1080/10503307.2019.1699972	Used same sample as Abel et al. (2016) and did not report on sudden gain reversal
O’Mahen (2017)	10.1016/j.brat.2017.05.011	Did not report sudden gain reversals
Larsen (2014)	10.1002/jclp.22092	Does not report on depression
Oliveira (2021)	10.1007/s41811-021-00106-w	Participants had diverse diagnosis
Andrews (2020)	10.1037/ccp0000467	Used same sample as already included from the CoBalT trial. Concern with

		trajectories rather than sudden gain reversals.
Terrill (2022)	10.1002/cpp.2734	No reporting of sudden gain reversals
Dour (2013)	10.1016/j.brat.2013.05.012	Participants had diverse diagnosis
Lorenz (2012)	No doi avialable	No reporting of sudden gain reversals
Helmich (2020)	10.1037/ccp0000469	No reporting of sudden gain reversals
Faustino (2019)	No doi available	Participants had diverse diagnosis
Wucherpfennig (2017)	10.1016/j.brat.2016.11.003	No reporting of sudden gain reversals
Zilcha-Mano (2019)	10.1037/ccp0000401	Participants had diverse diagnosis
Drymalski (2011)	10.1037/a0022973	No reporting of sudden gain reversals
Lorenz (2013)	10.1007/s10608-012-9510-3	Duplication
Durtnell (2013)	No doi available	Unable to access
Andrusyna (2006)	10.1080/10503300600591379	Duplicate
Singla (2019)	10.1177/2167702619825860	No reporting of sudden gain reversals
Lutz (2013)	10.1080/10503307.2012.693837	Participants had diverse diagnosis

Lemmens (2021)	10.3389/fpsyt.2021.576432	No reporting of sudden gain reversals
O'Mahen (2019)	10.1016/j.beth.2018.08.007	No reporting of sudden gain reversals
Lutz (2007)	10.1026/1616-3443.36.4.261	Unclear if main diagnosis of participants is depression.

Appendix D

Data extraction tool

Study name (date)

Data extracted by (date)

Study design

Setting

Country	
Treatment setting e.g., community, inpatient, primary care etc.	

Participants

Sample size	
Age group	
% female (if reported)	

Intervention

Intervention	
Comparator/ control intervention if applicable	

Sudden gain

Sudden gain criteria applied	
No. of sudden gainers	
Median sudden gain session	
No. sudden gain reverses	
No. of regainers	
Depression outcome measure used	

Appendix E

Effective public health practice project appraisal tool

QUALITY ASSESSMENT TOOL FOR QUANTITATIVE STUDIES

EPHPP
Effective Public Health Practice Project

COMPONENT RATINGS

A) SELECTION BIAS

(Q1) Are the individuals selected to participate in the study likely to be representative of the target population?

1 Very likely
2 Somewhat likely
3 Not likely
4 Can't tell

(Q2) What percentage of selected individuals agreed to participate?

1 80 - 100% agreement
2 60 – 79% agreement
3 less than 60% agreement
4 Not applicable
5 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

B) STUDY DESIGN

Indicate the study design

1 Randomized controlled trial
2 Controlled clinical trial
3 Cohort analytic (two group pre + post)
4 Case-control
5 Cohort (one group pre + post (before and after))
6 Interrupted time series
7 Other specify _____
8 Can't tell

Was the study described as randomized? If NO, go to Component C.

No Yes

If Yes, was the method of randomization described? (See dictionary)

No Yes

If Yes, was the method appropriate? (See dictionary)

No Yes

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

C) CONFOUNDERS

(Q1) Were there important differences between groups prior to the intervention?

1 Yes
2 No
3 Can't tell

The following are examples of confounders:

1 Race
2 Sex
3 Marital status/family
4 Age
5 SES (income or class)
6 Education
7 Health status
8 Pre-intervention score on outcome measure

(Q2) If yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?

1 80 – 100% (most)
2 60 – 79% (some)
3 Less than 60% (few or none)
4 Can't Tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

D) BLINDING

(Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?

1 Yes
2 No
3 Can't tell

(Q2) Were the study participants aware of the research question?

1 Yes
2 No
3 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

E) DATA COLLECTION METHODS

(Q1) Were data collection tools shown to be valid?

1 Yes
2 No
3 Can't tell

(Q2) Were data collection tools shown to be reliable?

1 Yes
2 No
3 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

F) WITHDRAWALS AND DROP-OUTS

(Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?

1 Yes
2 No
3 Can't tell
4 Not Applicable (i.e. one time surveys or interviews)

(Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).

1 80 -100%
2 60 - 79%
3 less than 60%
4 Can't tell
5 Not Applicable (i.e. Retrospective case-control)

RATE THIS SECTION	STRONG	MODERATE	WEAK	
See dictionary	1	2	3	Not Applicable

G) INTERVENTION INTEGRITY

(Q1) What percentage of participants received the allocated intervention or exposure of interest?

1 80 -100%
2 60 - 79%
3 less than 60%
4 Can't tell

(Q2) Was the consistency of the intervention measured?

1 Yes
2 No
3 Can't tell

(Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?

4 Yes
5 No
6 Can't tell

H) ANALYSES

(Q1) Indicate the unit of allocation (circle one)

community organization/institution practice/office individual

(Q2) Indicate the unit of analysis (circle one)

community organization/institution practice/office individual

(Q3) Are the statistical methods appropriate for the study design?

1 Yes
2 No
3 Can't tell

(Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received?

1 Yes
2 No
3 Can't tell

GLOBAL RATING

COMPONENT RATINGS
Please transcribe the information from the gray boxes on pages 1-4 onto this page. See dictionary on how to rate this section.

A	**SELECTION BIAS**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
B	**STUDY DESIGN**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
C	**CONFOUNDERS**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
D	**BLINDING**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
E	**DATA COLLECTION METHOD**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
F	**WITHDRAWALS AND DROPOUTS**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	Not Applicable

GLOBAL RATING FOR THIS PAPER (circle one):

1	STRONG	(no WEAK ratings)
2	MODERATE	(one WEAK rating)
3	WEAK	(two or more WEAK ratings)

With both reviewers discussing the ratings:

Is there a discrepancy between the two reviewers with respect to the component (A-F) ratings?

No Yes

If yes, indicate the reason for the discrepancy

1	Oversight
2	Differences in interpretation of criteria
3	Differences in interpretation of study

Final decision of both reviewers (circle one):

1	**STRONG**
2	**MODERATE**
3	**WEAK**

Appendix F

Quality appraisal scoring breakdown.

Paper	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and drop-outs	Global rating
Abel et al. (2016)	2	1	3	2	1	1	2
Aderka et al. (2021)	2	2	1	2	1	3	2
Andrusyna et al. (2007)	2	1	1	2	1	1	1
Bisby et al. (2022)	3	1	1	2	1	1	2
Busch et al. (2006)	2	1	1	2	1	1	1
Gaynor et al. (2003)	2	1	1	2	1	2	1
Hardy et al. (2005)	2	2	3	2	1	2	2
Hopko et al. (2009)	2	2	3	2	1	1	2
Hunnicutt-Ferguson et al. (2012)	3	2	1	2	1	3	3
Kelly et al. (2005)	2	2	3	2	1	3	3

Kelly et al. (2007)	3	2	1	2	1	3	3
Lemmens et al. (2016)	3	1	1	3	1	1	3
Manning et al. (2010)	2	2	3	2	1	3	3
Masterson et al. (2014)	2	1	1	2	1	1	1
Mechler et al. (2021)	3	1	1	3	1	1	3
O'Mahen et al. (2021)	1	1	1	2	1	1	1
Ryan (2013)	2	2	3	2	1	1	2
Singh et al. (2021)	3	1	1	2	1	1	2
Tang & DeRubeis (1999)	3	1	1	2	1	2	2
Tang et al. (2002)	3	3	1	2	1	3	3
Tang et al. (2005)	3	1	1	2	1	1	2
Tang et al. (2007)	3	1	3	2	1	1	3
Vittengl et al. (2005)	3	1	2	1	1	2	2

Appendix G

AMSTAR-2 rating

AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both

1. Did the research questions and inclusion criteria for the review include the components of PICO?

For Yes:
- ☑ Population
- ☑ Intervention
- ☑ Comparator group
- ☑ Outcome

Optional (recommended)
- ☐ Timeframe for follow-up

☑ Yes
☐ No

2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?

For Partial Yes:
The authors state that they had a written protocol or guide that included ALL the following:
- ☑ review question(s)
- ☑ a search strategy
- ☑ inclusion/exclusion criteria
- ☑ a risk of bias assessment

For Yes:
As for partial yes, plus the protocol should be registered and should also have specified:
- ☑ a meta-analysis/synthesis plan, if appropriate, *and*
- ☑ a plan for investigating causes of heterogeneity
- ☐ justification for any deviations from the protocol

☐ Yes
☑ Partial Yes
☐ No

3. Did the review authors explain their selection of the study designs for inclusion in the review?

For Yes, the review should satisfy ONE of the following:
- ☐ *Explanation for* including only RCTs
- ☐ OR *Explanation for* including only NRSI
- ☐ OR *Explanation for* including both RCTs and NRSI

☐ Yes
☑ No

4. Did the review authors use a comprehensive literature search strategy?

For Partial Yes (all the following):
- ☑ searched at least 2 databases (relevant to research question)
- ☑ provided key word and/or search strategy
- ☑ justified publication restrictions (e.g. language)

For Yes, should also have (all the following):
- ☑ searched the reference lists / bibliographies of included studies
- ☐ searched trial/study registries
- ☐ included/consulted content experts in the field
- ☑ where relevant, searched for grey literature
- ☐ conducted search within 24 months of completion of the review

☐ Yes
☑ Partial Yes
☐ No

5. Did the review authors perform study selection in duplicate?

For Yes, either ONE of the following:
- ☐ at least two reviewers independently agreed on selection of eligible studies and achieved consensus on which studies to include
- ☑ OR two reviewers selected a sample of eligible studies and achieved good agreement (at least 80 percent), with the remainder selected by one reviewer.

☑ Yes
☐ No

AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both

6. Did the review authors perform data extraction in duplicate?

For Yes, either ONE of the following:
- ☐ at least two reviewers achieved consensus on which data to extract from included studies
- ☑ OR two reviewers extracted data from a sample of eligible studies and achieved good agreement (at least 80 percent), with the remainder extracted by one reviewer.

☑ Yes
☐ No

7. Did the review authors provide a list of excluded studies and justify the exclusions?

For Partial Yes:
- ☑ provided a list of all potentially relevant studies that were read in full-text form but excluded from the review

For Yes, must also have:
- ☑ Justified the exclusion from the review of each potentially relevant study

☑ Yes
☐ Partial Yes
☐ No

8. Did the review authors describe the included studies in adequate detail?

For Partial Yes (ALL the following):
- ☑ described populations
- ☑ described interventions
- ☑ described comparators
- ☑ described outcomes
- ☑ described research designs

For Yes, should also have ALL the following:
- ☐ described population in detail
- ☐ described intervention in detail (including doses where relevant)
- ☐ described comparator in detail (including doses where relevant)
- ☑ described study's setting
- ☐ timeframe for follow-up

☐ Yes
☑ Partial Yes
☐ No

9. Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review?

RCTs

For Partial Yes, must have assessed RoB from
- ☑ unconcealed allocation, *and*
- ☑ lack of blinding of patients and assessors when assessing outcomes (unnecessary for objective outcomes such as all-cause mortality)

For Yes, must also have assessed RoB from:
- ☑ allocation sequence that was not truly random, *and*
- ☐ selection of the reported result from among multiple measurements or analyses of a specified outcome

☐ Yes
☑ Partial Yes
☐ No
☐ Includes only NRSI

NRSI

For Partial Yes, must have assessed RoB:
- ☑ from confounding, *and*
- ☑ from selection bias

For Yes, must also have assessed RoB:
- ☐ methods used to ascertain exposures and outcomes, *and*
- ☐ selection of the reported result from among multiple measurements or analyses of a specified outcome

☐ Yes
☑ Partial Yes
☐ No
☐ Includes only RCTs

10. Did the review authors report on the sources of funding for the studies included in the review?

For Yes
- ☐ Must have reported on the sources of funding for individual studies included in the review. Note: Reporting that the reviewers looked for this information but it was not reported by study authors also qualifies

☐ Yes
☑ No

AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both

11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results?

RCTs

For Yes:

- ☑ The authors justified combining the data in a meta-analysis
  - ☑ AND they used an appropriate weighted technique to combine study results and adjusted for heterogeneity if present.
  - ☑ AND investigated the causes of any heterogeneity

☑ Yes
☐ No
☐ No meta-analysis conducted

For NRSI

For Yes:

- ☑ The authors justified combining the data in a meta-analysis
  - ☑ AND they used an appropriate weighted technique to combine study results, adjusting for heterogeneity if present
  - ☑ AND they statistically combined effect estimates from NRSI that were adjusted for confounding, rather than combining raw data, or justified combining raw data when adjusted effect estimates were not available
  - ☑ AND they reported separate summary estimates for RCTs and NRSI separately when both were included in the review

☑ Yes
☐ No
☐ No meta-analysis conducted

12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?

For Yes:

- ☐ included only low risk of bias RCTs
- ☐ OR, if the pooled estimate was based on RCTs and/or NRSI at variable RoB, the authors performed analyses to investigate possible impact of RoB on summary estimates of effect.

☐ Yes
☑ No
☐ No meta-analysis conducted

13. Did the review authors account for RoB in individual studies when interpreting/ discussing the results of the review?

For Yes:

- ☐ included only low risk of bias RCTs
- ☑ OR, if RCTs with moderate or high RoB, or NRSI were included the review provided a discussion of the likely impact of RoB on the results

☑ Yes
☐ No

14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?

For Yes:

- ☐ There was no significant heterogeneity in the results
- ☑ OR if heterogeneity was present the authors performed an investigation of sources of any heterogeneity in the results and discussed the impact of this on the results of the review

☑ Yes
☐ No

15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?

For Yes:

- ☑ performed graphical or statistical tests for publication bias and discussed the likelihood and magnitude of impact of publication bias

☑ Yes
☐ No
☐ No meta-analysis conducted

AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both

16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

For Yes:

- ☐ The authors reported no competing interests OR
- ☐ The authors described their funding sources and how they managed potential conflicts of interest

☐ Yes
➨ No

To cite this tool: Shea BJ, Reeves BC, Wells G, Thuku M, Hamel C, Moran J, Moher D, Tugwell P, Welch V, Kristjansson E, Henry DA. AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both. BMJ. 2017 Sep 21;358:j4008.

Part two: Research paper

How can therapists facilitate an upward spiral following a sudden gain?

Abstract

Objectives: Sudden gains during psychological therapy for depression are suggested to cause an 'upward spiral' of increased therapeutic alliance and cognitive change. The mechanisms theorised as instigating the upward spiral include identifying the gain, exploring reasons for the gain, finding meaning in the gain and leveraging the gain. This paper explored if the theorised mechanisms, referred to as the rational model, are present in empirical data and aimed to develop and validate a model integrating the rational model and findings from empirical data.

Method: A task analysis of secondary data from a pragmatic, randomised, non-inferiority trial was conducted. Task analysis methods study the processes of change within psychotherapy sessions and comprise two main stages: building a rational-empirical model of the phenomenon under investigation and a validation stage to test to rational-empirical model. Of the 246 trial participants who met the inclusion criteria for this study, 108 experienced a sudden gain. Reflexive thematic analysis of 10 post-sudden gain session recordings was completed. Interpreted themes from this analysis were compared with the rational model to form a rational-empirical model. A small-scale validation phase inclusive of 10 participants was conducted.

Results: Identifying the gain, exploring reasons for the gain, keeping focus on the positive, using the gain and referring to therapy ending supported the client to experience an upward spiral. When the gain was attributed to external events only, not the session focus or, the client lacked confidence in the gain, the upward spiral was less observed. The small-scale validation provided some support for the rational-empirical model.

Conclusion: This study outlined five components that when incorporated in a post sudden gain session, could support a client to experience an upward spiral and superior outcomes. This model needs to be validated in a larger scale.

Key Words: Sudden gain, depression, task analysis, cognitive behavioural therapy, person centred experiential therapy, therapeutic gains.

Practitioner Points

- Therapists should administer outcome measures weekly to monitor symptom fluctuations and identify the occurrence of a sudden gains.
- Following a sudden gain therapists should identify the sudden gain with the client, discuss reasons for the gain, keep focus on the positive, use the gain and refer to the therapy ending.
- Therapists should be mindful of clients who lack confidence in the gain and support the client to observe the gain as a positive change attributed to the client's skills.

Introduction

Sudden Gains

The phenomenon of a sudden gain (that is, a large stable reduction in symptom severity between successive therapy sessions), has consistently been shown to predict improved patient outcomes (Shalom & Aderka, 2020). Since the establishment of sudden gain criteria by Tang and DeRubeis (1999), research into sudden gains has proved popular (Aderka et al., 2012). The relationship between sudden gains and superior therapeutic outcomes is evident across therapeutic modalities (Gaynor et al., 2003), methods of delivery (Hamdeh et al., 2019) and mental health presentations (Shalom & Aderka, 2020).

Whilst efforts in the literature have aimed to establish instigators of a sudden gain (Andrusyna et al., 2006; Durland et al., 2018; Hardy et al., 2005; Jun et al., 2013), sudden gain predictors remain unclear and findings in this area are inconsistent.

Post Sudden Gain Processes

Sudden gains have been shown to occur in individuals with diverse presentations, yet the literature has predominantly focussed on the prevalence of sudden gains in treatment for depression (Aderka et al., 2012). Aderka and Shalom (2021) proposed that rather than there being specific instigators of sudden gains, they occur naturally as part of the fluctuating nature of certain mental health conditions. Psychological therapy, however, can provide the context where positive fluctuations are identified and maintained leading to a sudden gain and better treatment outcomes. For example, Keller et al. (2014) found the presence of a sudden gain in patients receiving either medication or psychotherapy for the treatment of post-traumatic stress disorder predicted better treatment outcomes. Bisby et al. (2022) concluded that sudden gains were present in individuals undergoing both self-guided and therapist-guided therapy and that there was no significant difference in the stability of the sudden gain. This further supports that the conditions of therapy provide an environment for

the sudden gain to be maintained and superior outcomes to be achieved. The question then remains what happens in therapy to support the processing and maintenance of this sudden gain? And, if self-guided therapy has the same influence, what part could therapists play in the maintenance of sudden gains, if at all?

Tang and DeRubeis (1999) proposed that in therapy a sudden gain results in an 'upward spiral'. An upward spiral is an increase in therapeutic alliance following a sudden gain which is predicted to improve the patient's mood and facilitate further cognitive change resulting in symptom improvement and superior outcomes. In support, several studies have evidenced an increase in therapeutic alliance in post sudden gain sessions (Lutz et al., 2013; Wucherpfennig et al., 2017; Zilcha-Mano et al., 2019). Further cognitive change following a sudden gain has also been found in Bohn et al. (2013) who compared changes pre-and-post gain sessions in participants who received cognitive therapy (CT) and interpersonal psychotherapy (IPT). They found that cognitive changes preceded a sudden gain in those who received CT which resulted in superior outcomes when compared to IPT, supporting the upward spiral theory.

Sparking the Upward Spiral

Despite support for the upwards spiral theory, there is little suggestion as to how the patients go from making a sudden gain to experiencing an upward spiral. Aderka and Shalom (2021) proposed four components that occur in the post sudden-gain session to instigate the upwards spiral, leading to superior outcomes (Table 1).

The first stage is the identification of a sudden gain in session with the client. According to Aderka and Shalom (2021) monitoring clients' progress is essential in establishing sudden gains. Whilst research addressing the impact of identifying positive changes over the course of therapy directly with clients is sparse, there is consistent support for the benefit collecting and monitoring progress has on clients' symptoms improvement. For example, a meta-

analysis of randomised controlled trials found that when therapists monitored client progress throughout therapy, clients experienced reduced deterioration and superior outcomes, with increased prevalence of significant change in symptoms for individuals who were predicted poor outcomes (Lambert et al., 2018). Whilst the research into progress feedback emphasises the importance of outcome monitoring, it does not highlight the impact of feeding back changes over therapy directly with the client. However, Delgadillo et al. (2017) established that identifying and discussing outcome measures with patients can lead to similar outcomes to treatment as usual but in a shorter amount of time. This suggests that identifying and discussing symptom changes during therapy positively impacts therapy efficiency however, more needs to be understood about the impact of identifying sudden positive change with clients during therapy.

Table 1

Stages of Processing a Sudden Gain to Spark an Upward Spiral as Suggested by Aderka and Shalom (2021)

Stages of processing the gain	Description
1. Identifying	The acknowledgement and discussion of improvement.
2. Discussing reasons	Consideration of reasons for the gain, including clients' strengths and contextual factors.
3. Discussing meaning	Instigating learning from the gain and making meaning from the gain.
4. Leveraging	Using the gain to motivate clients to engage in further challenges or changes.

When discussing reasons for sudden gains, Aderka and Shalom (2021) highlight the importance of the client internally attributing the positive gain (Table 1, Stage 2). Weiner et

al. (1979) found that individuals are more likely to feel confident and competent when achievements are internally attributed. Johnson et al. (1998) found that when a depressed client internally attributed recent positive events, they experienced a decrease in their perceptions of hopelessness which mediated their decrease in depressive symptomology. Hence, attributing sudden gains to clients' strengths is predicted to instigate an upward spiral and further improve the clients' mood.

The third condition of making meaning has been evidenced as occurring in sudden gain literature. Adler et al. (2013) found that clients who made meaning of their therapeutic experiences were more likely to experience a sudden gain. In addition, engagement in meaning making during cognitive behaviour therapy (CBT) has been found to partially mediate the improvement in anxiety and depression symptomology pre and post therapy (Marco et al., 2020). This supports the notion that engaging in meaning making post sudden gain could lead to further reduced depression symptomology by the end of therapy.

The fourth condition of leveraging a gain to motivate further meaningful change is supported by Hobfoll et al. (2007) who found that patients improved only when they moved from meaning making to acting in meaningful ways. Considering meaningful action, Lemmens et al. (2021) explored what clients who had experienced a sudden gain attributed the gain to in the post-gain sessions. The largest between-session changes were observed at the post-gain session with there being the biggest change in the behavioural domain. This could be interpreted as changes in behaviour being necessary to instil positive change, suggesting leveraging this change to create further meaningful behavioural changes could only have a positive impact on therapeutic outcomes.

However, further exploratory research is needed to better understand what happens in post-sudden gain sessions to support the maintenance of a sudden gain and the instigation of an upward spiral linked to superior outcomes. Due to the recency of Aderka and Shalom's

(2021) study, there is no current evidence to confirm the existence of their outlined conditions prior to an upward spiral. Aderka and Shalom (2021) suggested that future studies should attempt to understand the process of change between processed and unprocessed sudden gains to show the conditions needed to spark an upward spiral. A processed gain would be a gain that is acknowledged and discussed in therapy and leads to superior outcomes, suggesting the successful occurrence of an upward spiral. An unprocessed gain is a sudden gain which results in a sudden gain reversal or insignificant outcomes by the end of therapy.

Task analysis is a suitable method to investigate the differences between processed and unprocessed gains. Task analysis captures the change process involved in the completion of a therapeutic task within therapy (Greenberg, 1984, 2007). This multi-method analytic approach allows a model to be tested, refined, and validated and specifically compares examples of a task being successfully executed (processed) to examples of a task being poorly executed (unprocessed). A task analysis has two overarching phases: a discovery-oriented phase and a validation-oriented phase. The discovery-oriented phase includes the creation of a rational model where a hypothetical model of the processes needed to happen for a task to be achieved is derived from the literature. An empirical model is then created from the analysis of empirical data where there are examples of the task being successfully and unsuccessful processed. An iterative comparison of the empirical and rational model is completed to form a new rational-empirical model. The validation-oriented phase is then focussed on understanding if this rational-empirical model can successfully differentiate processed and unprocessed tasks and relates the model to therapeutic outcomes. This methodology has previously been adapted to create and validate models of adverse processes in therapy (Curran et al., 2019) as well as the processes taken in therapy to heal from distress related to heterosexism (Collins & Levitt, 2022).

Current Study

The primary aim of this study was to investigate if the theoretical conditions needed to spark an upward spiral, as outlined by Aderka and Shalom (2021), occurred within post-sudden gain therapy sessions. Secondly, the study aimed to build on Aderka and Shalom's (2021) model using the findings from empirical data, corroborating, or adjusting their proposed model as appropriate. Thirdly, the study aimed to present an example of a small-scale validation for the new model.

Method

Design

A mixed-method, secondary data analysis design was adopted. A task analysis was conducted as described by Greenberg (2007).

Secondary Data Overview

Barkham et al. (2021) conducted a pragmatic, randomised, non-inferiority trial (PRaCTICED) within the then named Sheffield Improving Access to Psychological Therapies (IAPT) service, now termed National Health Service (NHS) talking therapies. Sessional audio recordings and outcome data from the trial were used in this study.

Participants

PRaCTICED trial participants had to be aged 18 or over, have a score of 12 or more on the Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001; See Appendix A), indicate that depression was their primary concern and have no treatment preference. Only participants with moderate or severe depression as rated on the Clinical Interview Schedule-Revised (CIS-R; Lewis et al., 1992) were included. Participants with organic conditions, long term physical health conditions, alcohol or substance dependency, elevated risk of suicide and a previous diagnosis of personality disorder, bipolar disorder or schizophrenia were excluded. A total of 510 participants were included in the trial of which 293 were female. The

participants were randomly allocated to two treatment groups; 254 participants received person-centred experiential therapy (PCET) and 256 received CBT.

For inclusion in the current study participants must have attended at least three sessions of CBT or PCET, experienced a sudden gain, and had no missing PHQ-9 data. Participants who switched therapy during treatment were excluded.

Therapists

Therapists (*n*=50) were accredited by a recognised professional body, met their professional bodies' standards, and fulfilled the job requirements of an IAPT high-intensity practitioner. Counsellors had completed and passed PCET training and CBT therapists received refresher training specific to Beckian CBT. The trial devised treatment manuals for both PCET and CBT. The ten-item Person-Centred and Experiential Psychotherapy Scale (PCEPS; Freire et al., 2011) and 12-item Cognitive Therapy Scale-Revised (CTS-R; Blackburn et al., 2001) were used to measure adherence to PCET and CBT respectively on a sample of recordings. The mean adherence score for PCET was 39.3, just slightly under the score of 40 which would show good adherence to the model. The mean adherence score for CBT was 40.8, documenting good adherence to CBT.

Measures

Only PHQ-9 data was used within this study. The PHQ-9 is a self-administered measure of depression that identifies the presence of clinical depression and the severity of symptoms. Scores of five represent mild depression symptoms, ten represents moderate, fifteen is indicative of moderately severe symptoms and scores of twenty signify severe depression. The clinical cut-off on the PHQ-9 as defined in the IAPT manual is 10 (National Collaborating Centre for Mental Health, 2021). The PHQ-9 has a Cronbach's alpha score of 0.89 demonstrating excellent internal reliability and excellent test-retest reliability (Kroenke et al., 2001).

Sudden Gain Criteria

A sudden gain was defined in line with Kelly et al. (2005):

1) A significant improvement on the PHQ-9.
2) Representing at least a 25% decrease in depression symptoms.
3) Maintained consistently over three sessions as shown by an improvement of 1.5SD from the individuals' mean.

This sudden gain criteria allowed for early and late sudden gains to be established. A sudden gain reversal was identified as a loss of 50% or more of the sudden gain improvement at any point post-sudden gain (Tang & DeRubeis, 1999). Sudden gains were identified in collaboration with peer HM (see Appendix B for collaboration statement)

Task Analysis

Figure 1 provides an overview of the steps of task analysis taken in this study.

Rational Model

Aderka and Shalom's (2021) proposed model of therapeutic conditions needed to instigate an upward spiral formed the rational model for this study. Aderka and Shalom's (2021) model was not specific to a therapeutic modality and so it was appropriate to use this as the rational model to compare with empirical data from both PCET and CBT sessions.

Empirical Model

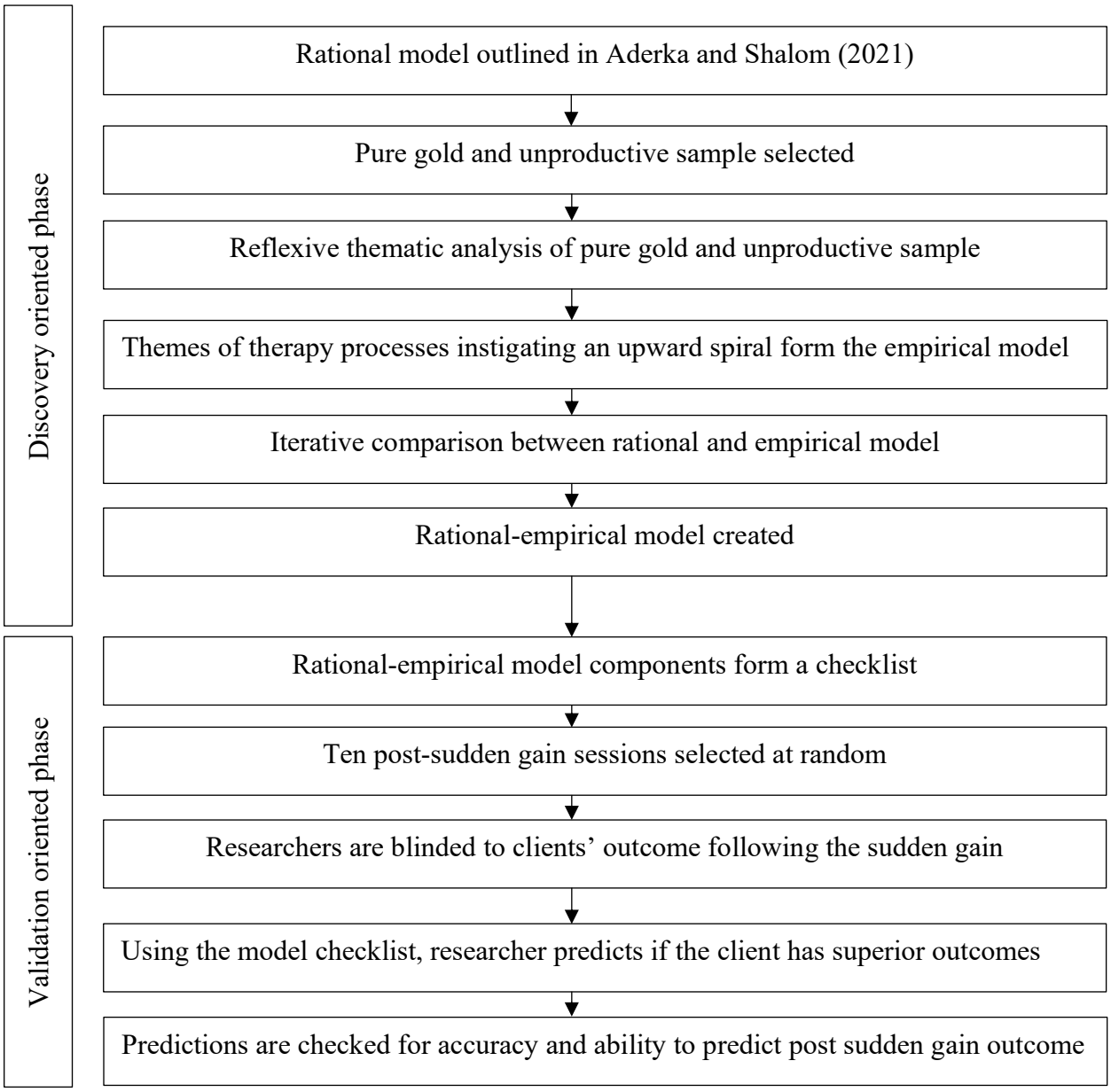
Sample

"Pure gold" sampling in task analysis entails purposely choosing to analyse sessions that are the best examples of a client and therapist working to resolve a task (Greenberg, 2007). Pure gold examples were the post sudden gain sessions of clients who had maintained their sudden gain (no reversal), had the largest decrease in depression symptoms and, scored less than 10 on the PHQ-9 by therapy termination, thus indicating the likely occurrence of an upward spiral. In addition, including the analysis of unproductive examples highlighted

components that were unique to pure gold examples of task completion. Unproductive examples included the post-gain sessions of participants with the poorest reduction on the PHQ-9, including those who experienced a sudden gain reversal. The unproductive sample is representative of cases where the sudden gain is unprocessed, and the individual does not benefit from superior outcomes. The sample size suggested as manageable, and the minimum needed to reach an empirical model was three pure gold cases and three unproductive cases (Greenberg, 2007).

Figure 1

Outline of the Task Analysis Process Adopted in this Study.



As this study included participants from both the CBT and PCET arms, four pure gold examples were initially identified; two who experienced CBT and two who received PCET. This was repeated for the unproductive cases, leaving eight initial cases to compare. Greenberg (2007) suggested saturation usually occurs within analysis of 9-12 task-resolution sessions. The concept of saturation is poorly operationalised and has been critiqued when adopting qualitative methods such as reflexive thematic analysis (RTA; Braun & Clarke, 2021). Arguably, the quality of the data used exceeds the quantity of data used, in that if the data gathered is rich in information to answer the research question, smaller samples are sufficient. This is referred to as information power (Malterud et al., 2016). This study's narrow research question, direct comparison to existing theory and, strong quality of dialogue from therapy session recordings suggests a smaller sample size is likely to hold sufficient information power (Malterud et al., 2016). A further two 'pure gold' samples were analysed to the point where information power was deemed sufficient. Overall, six 'pure gold' sessions

Reflexive Thematic Analysis

The author transcribed eight initial post sudden gain sessions and a further two were transcribed by an approved University of Sheffield transcriber.

RTA was conducted as described by Braun and Clarke (2006) with acknowledgement to later published conceptualisations of this method (Braun & Clarke, 2019, 2020). Template analysis was considered however, this would have merged the empirical stage of task analysis with the creation of a rational-empirical model, muddying the task analysis methodology. An inductive approach to RTA was used to draw themes from the data, supporting the purpose of empirical modelling as outlined by Pascual-Leone et al. (2009). The researchers were unable to escape knowledge of prior theoretical assumptions, hence the analysis is best described as grounded in the data (Braun & Clarke, 2021). Thematic analysis has previously been used within the task analysis protocol (Collins & Levitt, 2021; Curran et al., 2019).

Braun and Clarke (2006) do not refer to an epistemological position when conducting RTA. The position of social constructionism was adopted in this research, that is the perception that our reality is constructed through interpersonal and social influences (Gergen, 1985). Thematic analysis has been evidenced as helpful in illuminating social constructionism processes (Joffe, 2011).

Following the six stages of RTA (Braun & Clarke, 2006), each transcript was read and re-read whilst listening to the corresponding audio file and initial ideas relevant to the research question were noted (See Appendix C). Each transcript was coded and codes were then organised into potential themes. Five iterations of theme combinations were reviewed to ensure the themes best represented the coded data extracts (See Appendix D). Recoding was conducted where necessary, emphasising the iterative nature of the analysis. Themes were named and defined, and a concise narrative of the data is presented in this report.

Rational-Empirical Model

The rational model and empirical models were compared. Where the empirical model corroborated elements of the rational model, these elements were retained. Where the empirical model added new learnings, these were integrated into the rational-empirical model.

Validation Phase

A comparative group design was used to explore if the rational-empirical model could predict when a sudden gain was successfully processed, and an upward spiral occurred.

A researcher, separate to this study (HM), randomly chose 10 recordings of post-sudden gain sessions through an online random number generator from the remaining data set. The lead researcher transcribed and listened to the post sudden-gain sessions and noted the presence of the rational-empirical model using a checklist (See Appendix E). This process was replicated by the supervising researcher (GH). Both researchers were blind to the client

outcomes at this stage of analysis. Where seven or more of the model components were present in the transcript, it was predicted that the gain was successful. Successful processing was indicated by a maintained sudden gain, a reliable drop of more than or equal to six on the PHQ-9 by the end of therapy and, a final PHQ-9 score below the clinical cut-off of 10 as defined in the IAPT manual (National Collaborating Centre for Mental Health, 2021). Unsuccessful processing was predicted if no more than 3/10 elements of the model were present in the transcript. Unsuccessful outcomes were defined as when clients did not make a reliable change or scored above ten on the PHQ-9 by the end of therapy and could have experienced a reversal.

Fisher's Exact t-tests have previously been employed in task analysis literature to understand if the prevalence of rational-empirical model components significantly differed across successful and unsuccessful task completion (Greenberg & Foerster, 1996; Greenberg & Malcolm, 2002). Due to the small sample in this study's validation phase, such quantitative analysis would not produce reliable results.

Approvals

Barkham et al. (2021) received NHS ethical approval prior to the trial and the Sheffield IAPT service gathered participants' consent for their data to be used within research. Ethical approval from the University of Sheffield was obtained in December 2021 (See Appendix F). Secondary quantitative data had previously been anonymised for use in research and was therefore suitable for secondary data analysis without further NHS ethical approval. Qualitative data was anonymised at the stage of transcription as per best practice guidelines (Tripathy, 2013). As consent to publish direct quotes from therapy was not gained in the trial, this paper has provided exemplars of the quotes from therapy that contribute to the themes. Exemplars involve paraphrasing participant quotes, so the quote retains its meaning but does not use the participants' direct words. This method of reporting is often

employed in social media studies where direct quotes could be potentially identifying (Ayers et al., 2018) and an example of this reporting from thematic analysis is provided in Stevens and Wood (2019).

Quality Control

The researcher's prior knowledge of theories of sudden gains could influence the empirical analysis. A reflexive statement was produced outlining the potential biases held by the researcher (See Appendix G). A reflexive journal allowed for reflection of how personal interests and biases may impact the data interpretation (See Appendix H). Whilst a sample of the coded transcripts were sent to the research supervisor to oversee the process, inter-rater consensus was not sought to remain in line with the underlying values of RTA (Clarke & Braun, 2019). Discussions between the researcher and research supervisor facilitated theme refinement.

An audit of themes was conducted by a researcher separate to the project (CG) who reviewed whether the themes captured the complexity of the coded extracts. The eight "Big-Tent" criteria for excellent qualitative research (Tracy, 2010; See Appendix I) were applied. Tracy's (2010) quality appraisal tool assessed quality based on worthiness of topic, sincerity, credibility, resonance, significant contribution, ethics, and meaningful coherence.

Data Security

Electronic files were password protected and stored on a shared drive which only the research team had access to. All stored data was anonymised.

Participant Involvement

The PRaCTICED trial was informed by a patient and public (PPI) group who commented on the appropriateness of the trial for both the participants involved and whom the findings apply to. The PPI group has since disbanded and are unable to be consulted.

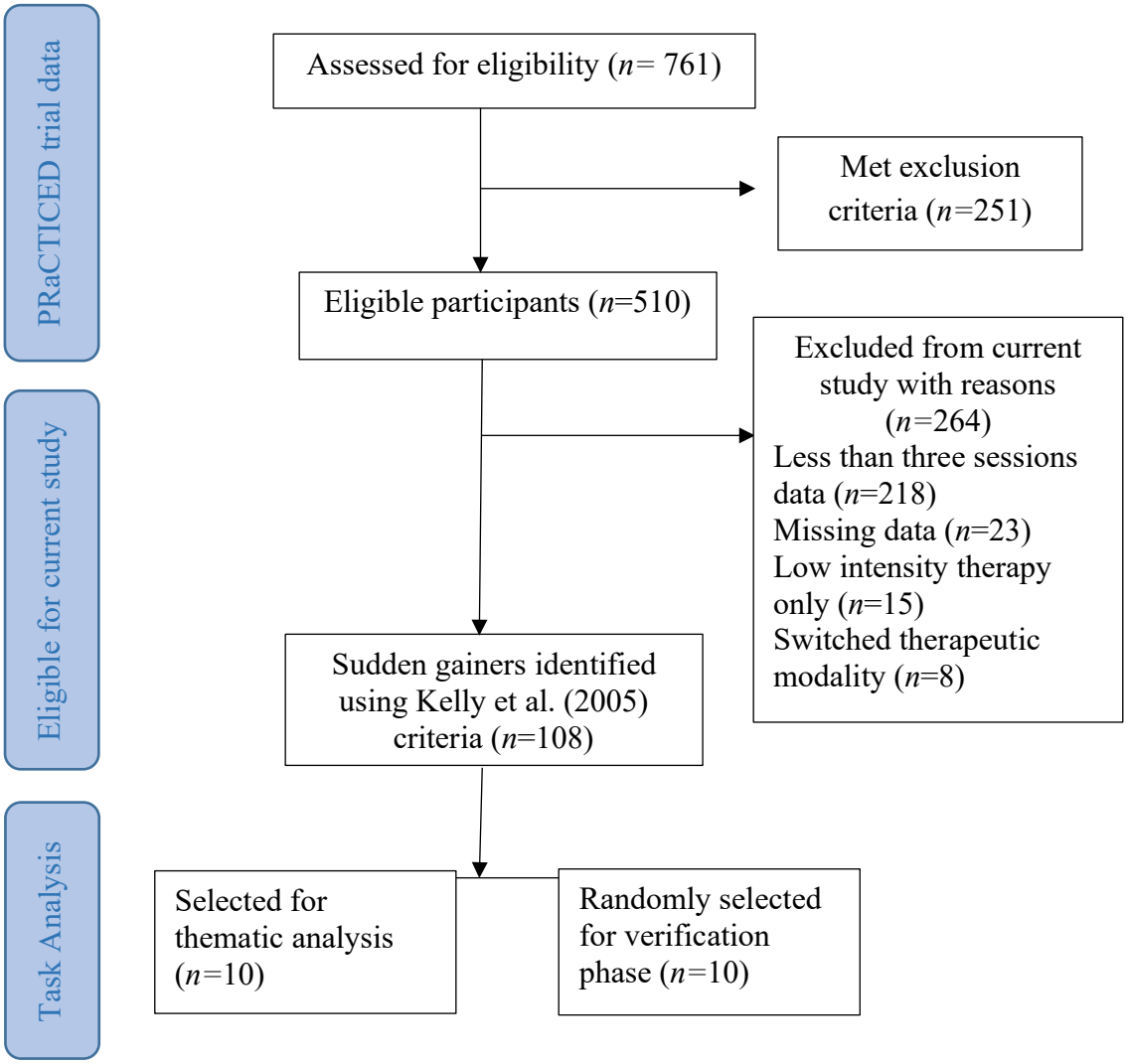
Results

Sudden Gainers Descriptive Statistics

Of the 510 participants included in the PRaCTICED trial, 246 (n=114 CBT; n=132 PCET) had at least three sessions and no missing data, 59.8% (n=147) of whom identified as female. See Figure 2 depicting the study's flow of participants. Participants averaged 38 years-old (SD=12.38) and 85% (n=209) identified as White British. The mean number of sessions attended was 10.94 (min= 3, max=23, SD 5.71).

Figure 2

Participant Flow Diagram



Sudden gainers constituted 43.9% (n=108) of the sample with most experiencing one sudden gain (n=90), 16 had two sudden-gains and two experienced three sudden gains. A

total of 128 sudden gains were found. The median pre-gain session was session five. The average magnitude of the sudden gains was a drop on the PHQ-9 of 8.49 (SD=2.63). Of those who had a sudden gain, 40.74% (n=44) experienced a reversal. Of the sudden gain reversers, 47.73% (n=21) experienced a regain evidenced as a return to their post-gain session score.

Considering therapeutic modalities, 42.98% (n=49) of the CBT group experienced a sudden gain and 44.7% (n=59) of the PCET experienced a sudden gain. There was no clinically significant difference in the prevalence of sudden gains between the two modalities; $t(244)=-.13$, $p=.42$. The median pre-gain session was five and four for CBT and PCET respectively.

Task Analysis Sample

The mean age of the pure gold sample group (n = 6) was 33 (min=19, max=63) and 83.4% were female. Mean severity at the initial session reported on the PHQ-9 for the pure gold sample was 20.83 (min=18, max= 24, SD=4.55) and the mean magnitude of the gain was 12.83 (min=9, max=16, SD=3.56). All clients had different therapists.

The unproductive sample (n = 4) had an average age of 36 (min=19, max 48) and 50% were female. Initial severity of depression averaged 13.75 (min=11, max=19, SD=3.78) in the unproductive sample which was significantly lower than in the pure gold sample; $t(6)=4.09$, $p=.006$. The mean magnitude of the sudden gain in the unproductive sample was 8.25 (min=6, max=12, SD=2.63) which was a significantly smaller than that reported in the pure gold sample; $t(6)=2.825$, $p=.03$. No two clients in the unproductive sample had the same therapist.

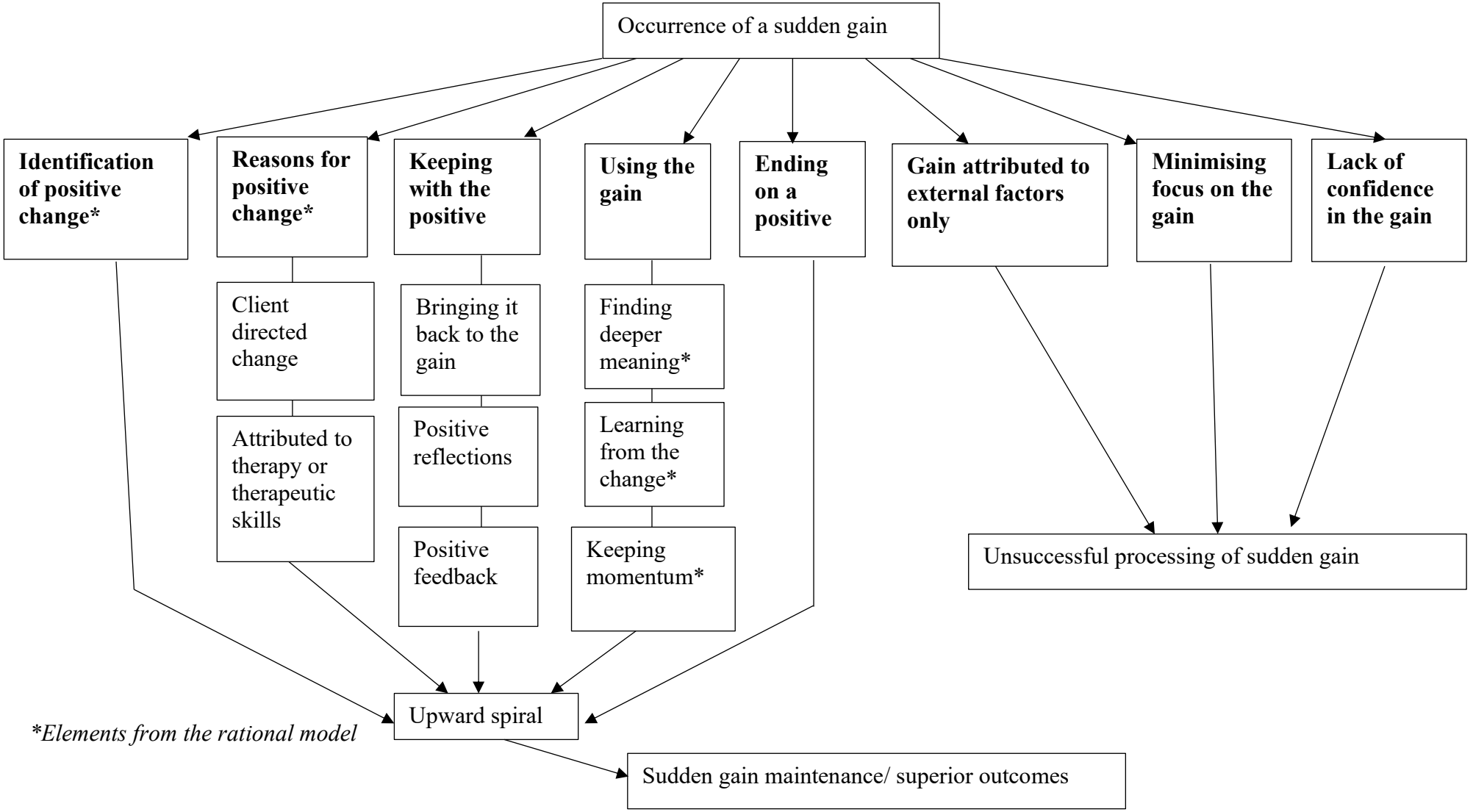
Rational-Empirical Model

Thematic analysis identified five overarching themes and nine subthemes that outlined the processes supporting the instigation of an upward spiral. A further three themes were identified as blocks to the upward spiral process. An empirical model was constructed

with each theme forming a model element. The empirical and rational model were then compared. All elements of the rational model suggested by Aderka and Shalom (2021) were corroborated in the new rational-empirical model. Figure 3 provides an overview of the synthesised rational-empirical model. The analysis built on the initial model, merging the ‘discussing meaning’ and ‘leveraging’ elements to form ‘using the gain’, adding the ‘keeping with the positive’ and ‘ending on a positive’ elements and providing detailed sub themes within the retained model elements. The contribution of each analysed session to the overall themes and subthemes are presented in Table 2.

Figure 3

Rational-Empirical Model of Successfully Processing a Sudden Gain to Instigate an Upward Spiral



**Elements from the rational model*

Table 2

Contribution of Each Transcript to the Themes.

	C425	C464	C546	C684	C31	C381	C227*	C631*	C715*	C426*
Identification of the positive change	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reasons for positive change										
Client directed change	✓	✓	✓	✓	✓	✓		✓	✓	
Attributed to therapy or therapeutic skills	✓	✓	✓	✓	✓		✓	✓		✓
Keeping with the positive										
Bringing it back to the gain	✓	✓	✓	✓	✓		✓			✓
Positive reflections	✓	✓	✓	✓				✓	✓	
Positive feedback	✓	✓	✓	✓	✓		✓	✓	✓	✓
Using the gain										
Finding deeper meaning	✓	✓		✓						
Learning from the change	✓	✓	✓	✓		✓		✓		✓
Keeping momentum	✓	✓	✓	✓	✓			✓		✓
Ending on a positive	✓	✓	✓	✓	✓					
Gain attributed to external factors	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Minimising focus on the gain			✓				✓	✓	✓	✓
Lack of confidence in the gain							✓	✓	✓	

*Unproductive sample

Identification of the Positive Change

Key to being able to maintain the sudden gain via triggering an upward spiral was to first identify the sudden gain. This was not unique to the successful task completion sessions but was identified as essential to being able to discuss the gain. Whilst all clients had experienced a sudden gain it is referred to here as a positive change as clients and therapists did not use the term 'sudden gain'. In some sessions, the exact drop in scores were referred to such as "*T: Thank you. I've looked over the measures and your depression score is really good! It's dropped to three!*" (C277). In other sessions the positive change was referred to without the reference to exact scores. "*The last few days have been really good T: That's good to hear.*" (C631).

Processes following the positive change identification appeared similar regardless of whether the therapist or client first identified the change.

Reasons for Positive Change

Clients and therapists then went onto explore reasons for the positive change. There was an attempt in all pure gold sample sessions to understand why the change occurred. The two subthemes outlined below capture where clients assign the reason for the change.

Client Directed Change

A feature distinguishing the successful sessions from the unproductive sessions was that the client assigned the change to something they had personally changed or implemented, often including a change in their coping and thinking styles.

> *I've been challenging and pausing before doing something like trying not to avoid relationships (3.2) I'm trying to not keep things in and talk- not necessarily about how I'm feeling but about what's happening for me because then it's not bottled up.* (C425)

Links were made between clients' strengths and positive change, highlighting the clients' roles in making the positive change, "*T: Great, you're learning what works best for you and what make you happy and how you want your life to be*" (C631).

Block to Successful Processing: Gain Attributed to External Factors Only

In the unproductive cases, clients often attributed the gain to an external event out of their control only for example, "*The weather's been nice this week, I've started my tablets too. It could be the weather or the tablets*" (C631).

Whilst there were examples in the pure gold sample of the client assigning the change to an external event, the therapist and client continued to explore the gain and made some attempt to link this gain to the clients' internal attributes and efforts.

Attributed to Therapy or Therapeutic Skills

Both clients and therapists explored the positive change in relation to the provision of the therapeutic space or skills developed within therapy. "*There were reasons I wanted counselling over six months ago (3.1) and initially I shared I was surprised (..) but when I've talked about it, I've actually almost felt like I am free of those difficulties.*" (C546)

Where clients referred to changes in their thinking styles or behaviours influencing the positive change, therapists often reinforced this as the relationship between the development of therapeutic skills and the positive change.

> *T: Yeah, so even though you are not using the sheets we introduced in therapy to challenge your thoughts, you are challenging them. When you get used to thinking in a certain way it can be hard to challenge.* (C425)

Keeping with the Positive

A distinguishing feature between the successful processing of the sudden gain to instigate an upward spiral and the unproductive task completion sessions was duration of the session dedicated to discussing the positive change. The percentage of coded words on each

transcript encompassing positive change discussion was calculated. On average, the pure gold sample discussed the positive change for 49.29% (min=37.35%, max= 64.95%) of the transcript.

Block to Successful Processing: Minimising Focus on the Gain

By comparison to the pure gold sessions the percentage of the unproductive samples' transcripts spent discussing the sudden gain was much lower and ranged from 4.9% to 29.88% with a mean of 16.26%. Clients seemed to deviate from positive discussion to become more problem oriented. In some cases, there was an attempt to remain on the positive change by the therapist but in the processes between the client and therapist, the narrative remained stuck on problem-oriented discussion. "*T: So, things are going better now. 631: I've still got to sort my sleep out.*" (C631).

Bringing it Back to the Gain

When keeping with the positive, all pure gold cases appeared motivated to discuss the positive change for most of the session. Where the client showed reluctance to engage in discussion around the positive change or where their focus moved away from the change, therapists skilfully brought discussion back to the change. "*T: Last week we saw a dip in your mood. Well, it's longer than last week, isn't it? But actually, you've returned to where things where just before they dipped. So, you're back to an improvement."* (C31)

Positive Reflections

Under the theme keeping with the positive, clients referred to the positive change in relation to their past and emphasised their improvement in ways of coping and general wellbeing. The therapist would support these reflections and draw comparisons to more recent changes, comparing the client's wellbeing at the start of therapy to the post sudden gain session.

> *I can finally be me and talk about what I want, I can talk about my thoughts and feelings and not worry about being treated badly or someone taking that information and then using it against me like people have done in the past.* (C684)

The therapist and client commonly referred to their goals at the start of therapy and whether this was achieved. "*T: If you think back to the start of therapy. I guess let's do a bit of a review. How do you think you've changed in comparison to then?"* (C546)

Positive Feedback

Within the keeping with the positive theme, another key feature in the pure gold sample was the provision of positive feedback regarding the positive change and the clients' general strengths. "*You're doing amazingly well. You are proving that now you are prioritising your wellbeing"* (C425).

The therapist's positive stance reinforced the changes whilst also inferring that the client was responsible for the change. Furthermore, clients in the pure gold sample shared examples where their social circle noticed and praised them on their positive change. "*There has been a positive change and she [sister-in-law] said, "you're the happiest I've ever seen you" and she has been with my brother for a few years"* (C684).

Using the Gain

In the pure gold sample, the therapist and client were focussed on the positive change and able to make use of it in a way that could instil further positive change.

Finding Deeper Meaning

One way therapists used the positive change was to explore the change further and link it to a deeper level of change within the client by thinking about how the changes have impacted their beliefs, feelings, and behaviours. "*T: Yeah so this letting go, how does that make you feel really?"* (C464). In some instances, a client's formulation was used to aid the reflection on change at a core belief level.

T: And so, bringing it back to the formulation to see if it fits at all (.) it might link in with some of these younger experiences (14.0) what do you think?

425: I think it links to the clingy situation here but also the fear of being rejected (.) Like I had to keep going but for the first time I was sharing my experiences with her [sister-in-law] and she was sharing hers so I suppose this was challenging a core belief that others would reject me. (C425)

Learning from the Change

Moving from discussions around the sudden positive change and exploration of reasons, the client and therapist used the gain to discuss what could be learnt from the positive change.

T: So what can you take from what you've experienced like the worries about exams?

425: Probably that I do know a lot. Like I can't keep worrying about things that I can't control and to try and move on until I need to worry about it (..) and I always plan things (1.2) so I have always done my best and I know I am prepared (..) I do know more than I think. (C425)

This supported the client to identify specific mechanisms that supported the positive change.

Keeping Momentum

Linked to ideas around learning from the positive change under the theme of using the gain, the therapist and client often defined specific goals for further improvement before the end of therapy. The client and therapist used the positive change to instigate goals for further positive change or maintenance. "*There are a few things that you've started doing and it would be good to keep them going (..) Thinking about next week, what can you specifically do?"* (C464).

Block to Successful Processing: Lack of Confidence in the Gain

"*I still have a worry though, I wonder if it's just a good week and that there's still that chance it might go back*" (C715). In the unproductive sample, using the gain for further positive change was not facilitated and clients seemed more unsure of the gain and questioned the longevity of it. The client's lack of confidence in their ability to maintain the positive change appeared to be a factor inhibiting the upward spiral.

Ending on a Positive

Unique to the pure gold sample, the therapist or client referred to therapy coming to an end.

> *In preparation for the end of therapy it's important to think about the potential setbacks and it is probably really important for us to make sure we think about this in your relapse plan, so you can prepare for if these setbacks happen.* (C31)

The link to the ending was both explicit in some cases as evident in the extract above or was a gentler reminder that therapy is finite and there is planning to be done around the remaining number of sessions. "*So, I'm thinking maybe two or three more sessions if it all still feels OK, does this work for you?"* (C425).

Validation Phase Results

Of the 10 clients identified for the validation phase, six maintained their sudden gain (no reversal) and scored less than 10 on the PHQ-9 by therapy termination. Eight clients received PCET and two received CBT. The sample had a mean age of 42.1 (min=24, max=59, SD=11.83) and six were female. The mean initial depression severity score was 19.2 (SD=2.62) and the average magnitude of the sudden gain was 8.7 (SD=2.95).

The interrater agreement when completing the model checklist and predicting post-gain outcomes was 100% percent. The model successfully predicted the outcomes of seven out of 10 clients. Table 3 highlights the model elements accounted for in both processed and unprocessed post-gain sessions. Of the six clients who maintained their sudden gain and had

clinically significant improvements on the PHQ-9 by therapy termination, the model accurately predicted the outcome of four of these clients. Of the four clients who lost their sudden gain and had poor outcomes, the model successfully predicted the outcome of three of these clients. Qualitatively reporting on table 3, model elements of identifying reasons for positive change, keeping with the positive change, using the gain, and ending on a positive were more prevalent in the successfully processed cases, although not present in all six of them.

Table 3

Presence of Model Elements in Processed and Unprocessed Post Sudden Gain Sessions.

	Element	Sub element	Participant ID									
			566	171	393	123	045	701	724	298	383	211
Presence of model elements	Identified positive change		✓	✓	✓	✓	X	✓	X	✓	✓	✓
	Reasons for positive change	Client directed change	X	X	✓	X	X	✓	X	✓	✓	✓
		Attributed to therapy or therapeutic skills	✓	X	✓	X	X	✓	X	✓	✓	✓
	Keeping with the positive	Bringing it back to the gain	X	X	✓	X	X	✓	X	✓	✓	✓
		Positive reflections	X	X	✓	✓	X	✓	X	✓	✓	✓
		Positive feedback	X	X	✓	X	X	✓	X	✓	✓	✓
	Using the gain	Finding deeper meaning	X	X	✓	X	X	X	X	✓	✓	✓
		Learning from the change	X	X	✓	✓	X	✓	X	✓	✓	✓
		Keeping momentum	X	X	✓	X	X	✓	X	✓	✓	✓
	Ending on a positive		X	✓	✓	X	X	✓	X	✓	✓	✓
Researcher prediction			No	No	Yes	No	No	Yes	No	Yes	Yes	Yes
Actual outcome			No	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes

Discussion

Sudden gains have been consistently linked to superior outcomes in therapy (Shalom & Aderka, 2020). Tang and DeRubeis (1999) theorised that an upward spiral occurred following a sudden gain linking to superior outcomes. This research aimed to understand if the components theorised by Aderka and Shalom (2021) as instigating an upward spiral and supporting superior client outcomes were evident in the empirical data and if not, to amend the model accordingly. The four components theorised as supporting the upward spiral following a sudden gain were present in the empirical data. The current study built on the existing theory and merged two of the existing components. The empirical data suggested that to facilitate an upward spiral following a sudden gain, therapists and clients should identify the gain, explore reasons for the positive change, keep discussion on the positive change, use the gain for learning and motivating further change and discuss the ending of therapy. Barriers to maintaining a sudden gain were when the gain was attributed to external factors only, focus remained problem-oriented, and when there was lack of confidence in the sudden gain maintenance.

When applying the model to 10 transcripts, the model elements occurred more frequently in cases where sudden gains were maintained, and superior outcomes were achieved. The presence of the model elements was able to predict seven of the ten session outcomes correctly. This is promising given that other factors are likely to impact on client outcomes such as life events that cannot be predicted within the therapy session. As the model predicts outcomes higher than chance, it warrants further validation on a larger sample.

Supporting Existing Evidence

Lemmens et al. (2021) explored processes associated with sudden gains by similarly rating recordings at the post-gain session before drawing conclusions regarding what patients

attributed the change to. The results from this study corroborate those in found Lemmens et al. (2021) in that both studies found that in the post-gain session there was spontaneous discussion about the improvement in scores and attempts to assign reasons to this change.

Additionally, this study provided more clarification on how discussion around change could be facilitated to achieve better outcomes. For example, it was important to assign the change to the client's own strengths and actions. Much of the sudden gain research as to why sudden gains link to better outcomes is influenced by cognitive theory (Andrusyna et al., 2006; Tang & DeRubeis, 1999). Given that attribution theory has similar roots in cognition literature (Hilt, 2004), it is unsurprising that the attribution of sudden gains influences the trajectory of client outcomes following a sudden gain. Previous research exploring attribution retraining and depression suggests that interventions altering negative attributions improved the client's well-being and reduced levels of hopelessness (Wang, 2011). Supporting this, Abel et al. (2016) found that following a sudden gain, clients reported increased feelings of hope. The attribution of positive change to the client increases hopefulness, instigating a more positive outlook on therapeutic gains, increasing the likelihood of lasting positive change.

The included sample experienced either CBT or PCET which take different approaches to instigating change and could therefore move clients from a sudden gain to an upward spiral in different ways. However, there were similarities in the prevalence of sudden gains across CBT and PCET and when conducting RTA, the derived themes were represented in both CBT and PCET sessions. The rational model developed by Aderka and Shalom (2021) was created to capture generic components needed to instigate an upward spiral and were not specified to one therapy. Hence, the analysis of post-sudden gain sessions in two different interventions has allowed for the model to be applicable to therapy more generally.

Building on Theory

This study emphasises the importance of drawing explicit and continued focus to the positive change in the post-gain session. The rational-empirical model has clear similarities to the positive psychology derived themes identified in Scheel et al. (2012) where positive processes in therapy were explored. Three themes identified in Scheel et al. (2012) related to themes in this study. The first is using a strength-oriented processes in which the clients themselves were supported to identify their personal strengths and strengths within the therapeutic relationship and relate these to provision of therapy. Secondly, therapists taking the strength-oriented position instilled hope, empowered clients, increased clients' self-awareness, and allowed strengths to be used to motivate further change. The final theme of interest from Scheel et al. (2012) was that of positive meaning making in which therapists supported clients to recognise strengths in past difficulties and apply such strength-based learnings to future difficulties. The parallels between the themes in this study and those of Scheel et al. (2012) implies that integration of positive psychology approaches following sudden gains supports the maintenance and continued improvement of therapeutic outcomes.

The empirical analysis contributed the additional component of ending on a positive note. Existing literature suggests clients who have unplanned endings experience poorer clinical outcomes (Connell et al., 2008). This perhaps links to the observation of how discussing endings may contribute to the maintenance of sudden gains and improved outcomes. The process of discussing the ending in the post-gain session could empower the client to continue with the positive changes and progress towards becoming their own therapist.

Blocks Between the Sudden Gain and Upward Spiral

Manning et al. (2010) investigated whether life events, client resistance and therapist response could be linked to sudden gain reversals. Although only life events were seen as significantly different in the sudden gain reversals group in Manning et al. (2010), the current

study does suggest that client resistance may be linked to poorer outcomes following a sudden gain. In cases where the client was observed to resist positive change talk or show ambivalence towards the sudden gain, they were observed to experience poorer outcomes by the end of therapy. Supporting this, Hansen et al. (2005) found that client ambivalence, lack of hopefulness towards therapy relating to change and lack of self-efficacy, linked to sudden gain losses. It appears that for a sudden gain to be maintained, clients must be supported to trust that the gain is a stable positive change.

Limitations

Previous examples of task analysis have used 30 cases to complete the validation phase of the method (Greenberg, 2007). This study made use of 10 cases. This number of cases has limited power to complete quantitative analysis to support the validity of the rational-empirical model. However, it did allow for the full task-analysis method to be conducted and has provided an example of how this model could be validated in future studies on a larger scale. Whilst the current study could not support that the prevalence of model components significantly differed between successful and unsuccessful processing of sudden gains, future studies with larger samples could add further insight.

Due to the PPI group disbanding following the trial they were unable to be consulted during this study. This is a limitation of the paper. Consultation with experts by experience could have better informed the research aims and design. Furthermore, consulting experts by experience about the empirical model could have been helpful to understand if the themes were able to capture their experiences. The quality appraisal highlighted that whilst this paper showed good quality in seven domains, as outlined by Tracy (2010), there could have been improvements in the credibility domain. Thus, expert by experience reflections would have been valuable (Lindlof & Taylor, 2002).

Clinical and Research Implications

Quality appraisal findings suggested that this study had strengths in its contributions to clinical practice and research. This study suggests that whilst there are commonalities in the processes following a sudden gain that led to either an upward spiral or a usual/poorer outcome, there are additional processes therapists can facilitate to potentially support the instigation of an upward spiral. The rational-empirical model provides guidance to clinicians around the elements to include in post-sudden gain sessions to support clients to achieve improved outcomes. As the data was derived from practice-based evidence in an IAPT service, the findings are representative of clinical practice and as such the model is likely generalisable to day-to-day practice. However, further large-scale research is needed to understand the validity of this model. The paper provides a small-scale example of how this could be conducted.

The study further highlights the importance of sessional outcome monitoring in routine practice to allow for progress feedback and the identification of sudden gains during therapy. Without such monitoring and identification of a sudden gain, the components helpful to the maintenance of sudden gains cannot be facilitated.

A component unique to processed sudden gains was the discussion around endings. This study would suggest it is important to support a client to have a planned therapeutic ending where possible and to bring discussions around endings into post-sudden gain sessions. It is likely that this could instil hopefulness in the client that they can maintain their sudden gain and motivate them to become independent of therapy. An area of research that could prove interesting would be to understand the difference in sudden gain maintenance and impact on therapeutic outcomes between clients who have planned and unplanned endings to therapy.

Conclusions

The current study proposed alterations to the four components theorised by Aderka and Shalom (2021) necessary to support a client from a sudden gain to an upward spiral. These altered components are built from the existing theory and empirical evidence collected from an outpatient mental health service making them applicable to clinical practice. Clinicians are encouraged to track clients' sessional progress to support the identification of sudden gains. Once the sudden gain is identified, the therapist should facilitate discussion around the reasons for the sudden gain, remain focussed on the positive change, use the gain to motivate further change and refer to the therapy ending. Future research exploring the validity of this proposed model is recommended.

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Appendix A

Patient Health Questionnaire-9

Name _____ Date _____

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

(For office coding: Total Score ____ = ____ + ____ + ____)

Appendix B

Collaboration statement

Collaboration statement

This statement is intended to outline the individuals' contributions made to this thesis where elements of the analysis were undertaken in contribution with peer HM. These contributions were undertaken equally. All other work in this thesis was undertaken independently.

Work conducted in collaboration:

- Identification of sudden gains using the Kelly et al. (2005) criteria.
- Descriptive statistics of sudden gains found using the Kelly criteria.

Appendix C

Thematic analysis stage one familiarisation notes (extract)

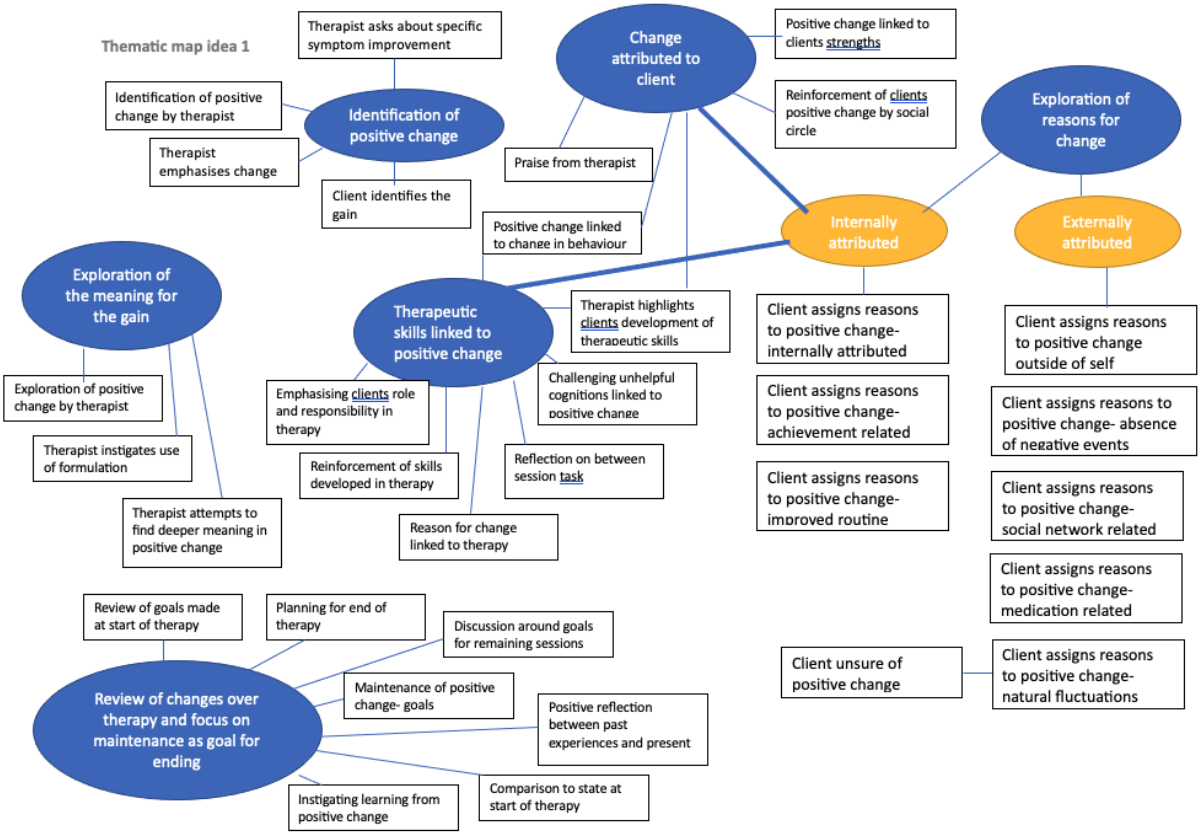
Initial notes from listening to transcripts

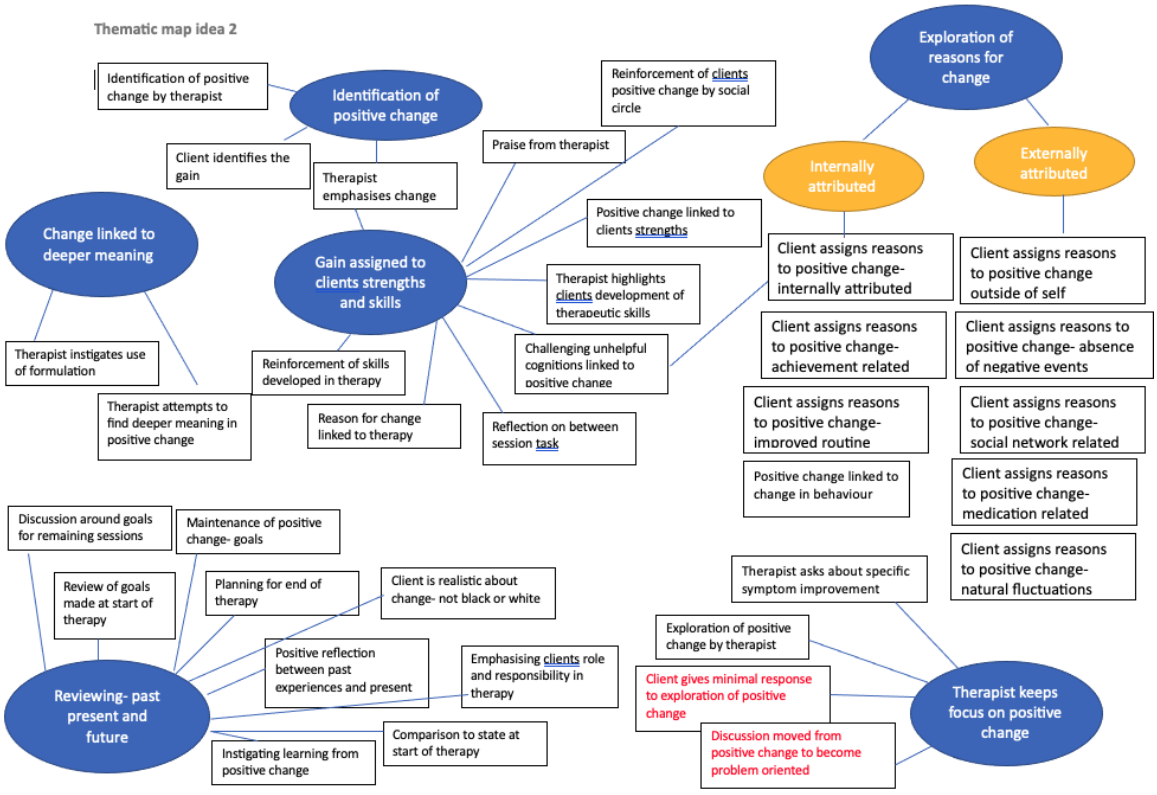
Overall observations around possible differences

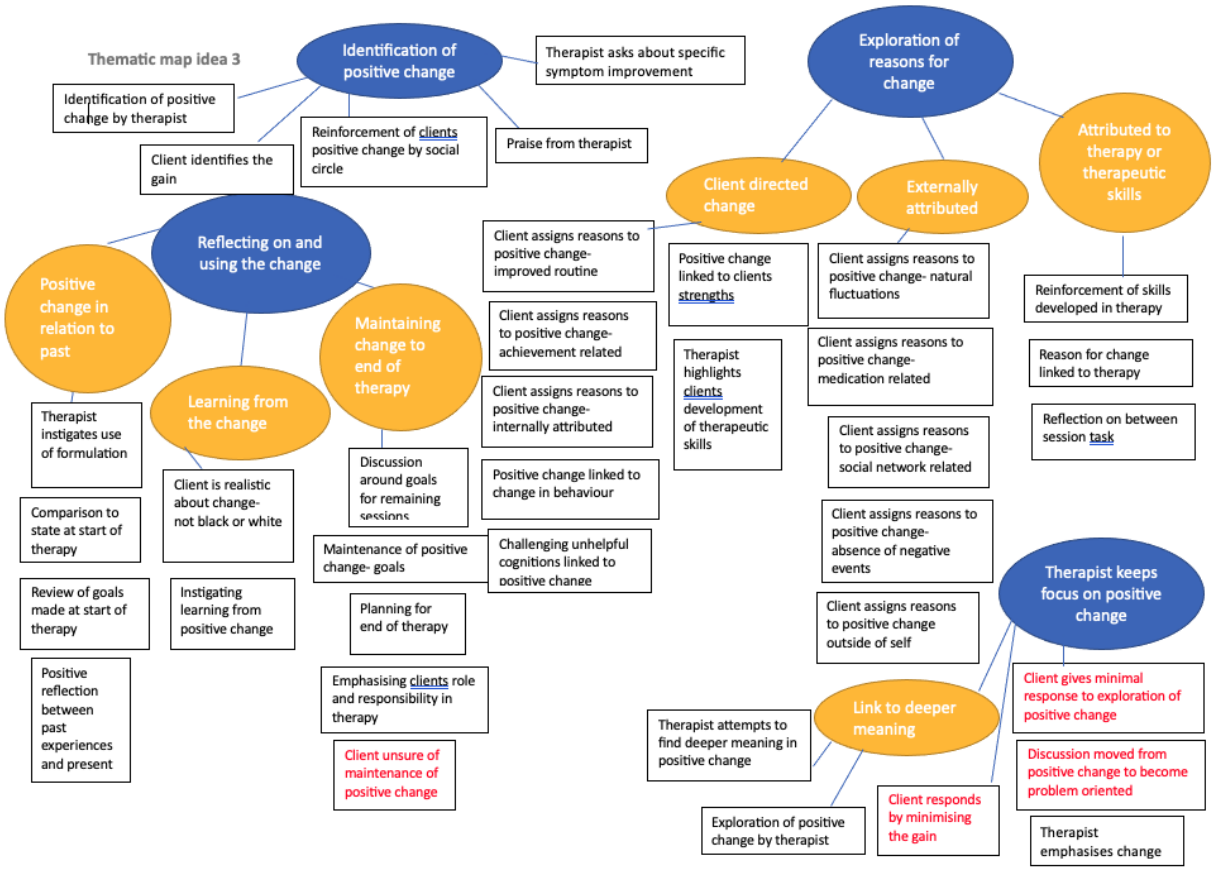
- Good examples tend to have the client point out improvement early in session
- In good examples client tends to assign change to self (changes in cognition or taking positive actions)
- In good examples the therapist tends to base the agenda around improvement or focus on positive aspects/changes over previous week
- In good examples the therapist seems to be strength focussed
- In good examples therapist tend to bring in thoughts around contracting an ending.
- In good examples therapist encourages reflection on change from initial sessions and looks at goals for the ending
- In poorer examples client assigns the change to aspects outside of self (e.g., the weather, general temporary improvement pattern)
- In poorer examples their tends to be less focus on improvement- discussion is more problem focussed
- In poor examples no mentions of ending.
- In poorer examples there tends to be either a great amount of or very little therapist involvement (seems unbalanced)

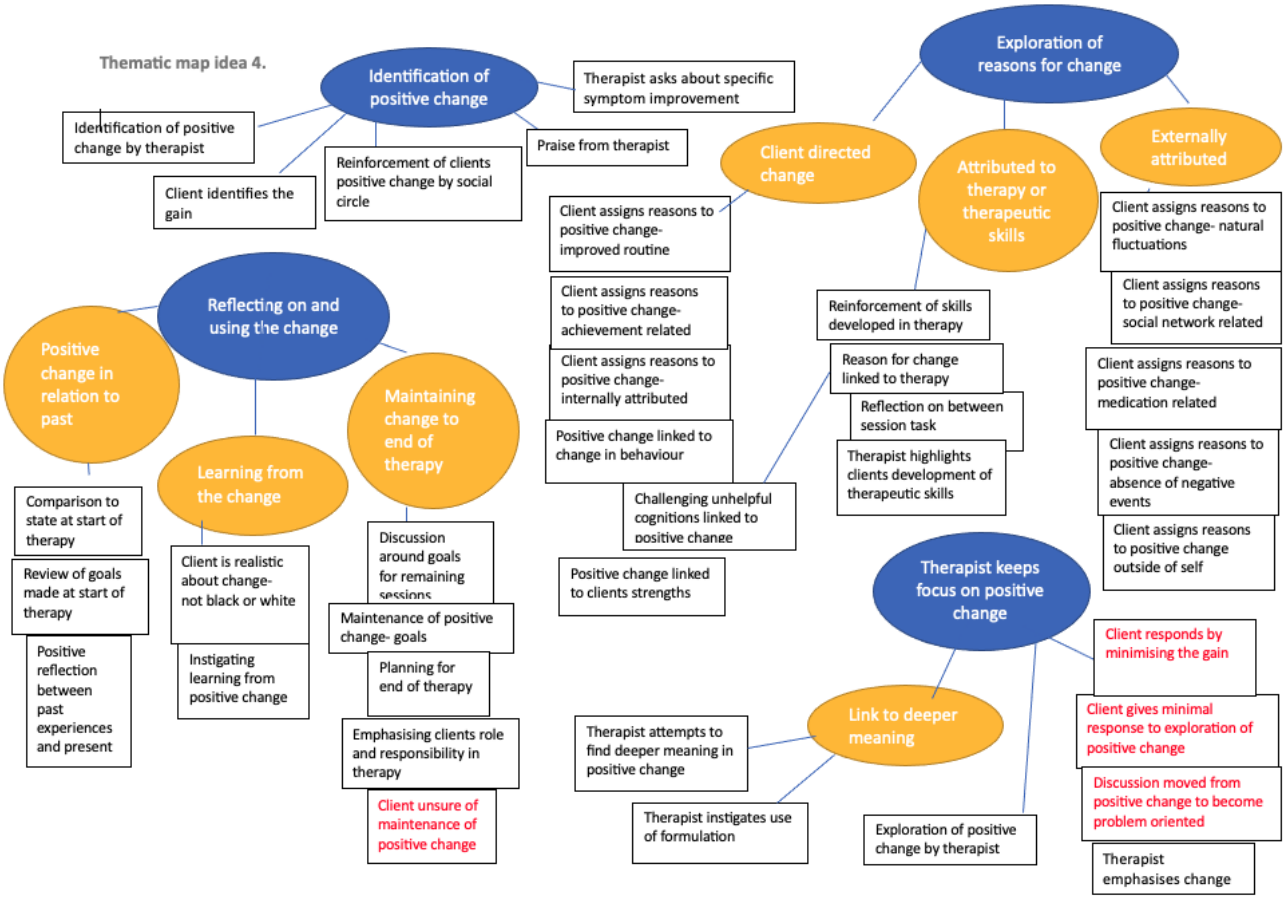
Appendix D

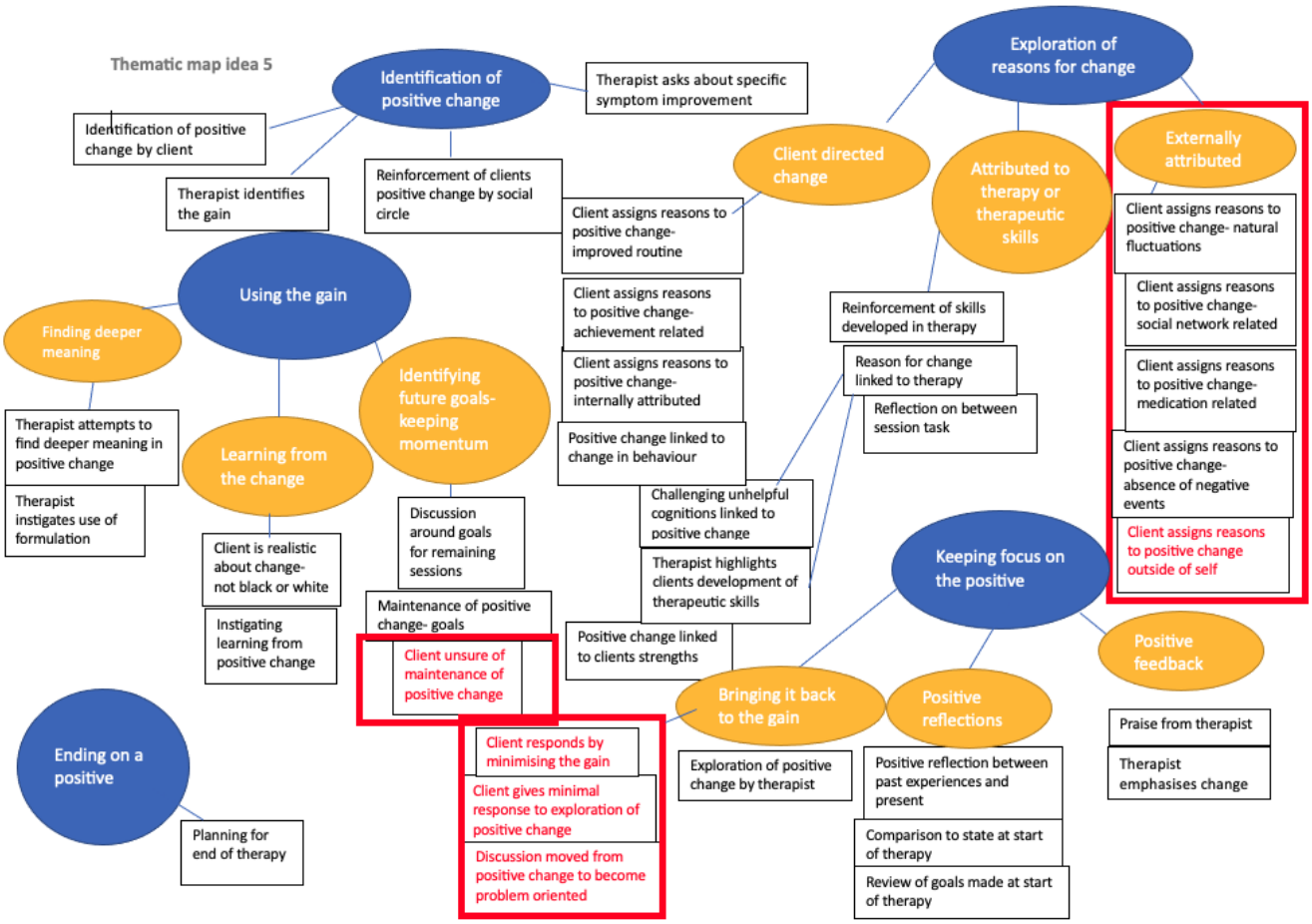
Thematic analysis final theme iterations






Thematic map idea 3
Identification of positive change
Identification of positive change by therapist
Client identifies the gain
Reinforcement of clients positive change by social circle
Therapist asks about specific symptom improvement
Praise from therapist
Reflecting on and using the change
Positive change in relation to past
Therapist instigates use of formulation
Comparison to state at start of therapy
Review of goals made at start of therapy
Positive reflection between past experiences and present
Learning from the change
Client is realistic about change- not black or white
Instigating learning from positive change
Maintaining change to end of therapy
Discussion around goals for remaining sessions
Maintenance of positive change- goals
Planning for end of therapy
Emphasising clients role and responsibility in therapy
Client unsure of maintenance of positive change
Exploration of reasons for change
Client directed change
Client assigns reasons to positive change- improved routine
Positive change linked to clients strengths
Therapist highlights clients development of therapeutic skills
Externally attributed
Client assigns reasons to positive change- natural fluctuations
Client assigns reasons to positive change- medication related
Client assigns reasons to positive change- social network related
Client assigns reasons to positive change- absence of negative events
Client assigns reasons to positive change outside of self
Attributed to therapy or therapeutic skills
Reinforcement of skills developed in therapy
Reason for change linked to therapy
Reflection on between session task
Client assigns reasons to positive change- achievement related
Client assigns reasons to positive change- internally attributed
Positive change linked to change in behaviour
Challenging unhelpful cognitions linked to positive change
Therapist keeps focus on positive change
Client gives minimal response to exploration of positive change
Discussion moved from positive change to become problem oriented
Therapist emphasises change
Client responds by minimising the gain
Link to deeper meaning
Therapist attempts to find deeper meaning in positive change
Exploration of positive change by therapist


Thematic map idea 4.
Identification of positive change
Identification of positive change by therapist
Client identifies the gain
Reinforcement of clients positive change by social circle
Therapist asks about specific symptom improvement
Praise from therapist
Reflecting on and using the change
Positive change in relation to past
Comparison to state at start of therapy
Review of goals made at start of therapy
Positive reflection between past experiences and present
Learning from the change
Client is realistic about change- not black or white
Instigating learning from positive change
Maintaining change to end of therapy
Discussion around goals for remaining sessions
Maintenance of positive change- goals
Planning for end of therapy
Emphasising clients role and responsibility in therapy
Client unsure of maintenance of positive change
Exploration of reasons for change
Client directed change
Client assigns reasons to positive change- improved routine
Client assigns reasons to positive change- achievement related
Client assigns reasons to positive change- internally attributed
Positive change linked to change in behaviour
Challenging unhelpful cognitions linked to positive change
Positive change linked to clients strengths
Attributed to therapy or therapeutic skills
Reinforcement of skills developed in therapy
Reason for change linked to therapy
Reflection on between session task
Therapist highlights clients development of therapeutic skills
Externally attributed
Client assigns reasons to positive change- natural fluctuations
Client assigns reasons to positive change- social network related
Client assigns reasons to positive change- medication related
Client assigns reasons to positive change- absence of negative events
Client assigns reasons to positive change outside of self
Therapist keeps focus on positive change
Client responds by minimising the gain
Client gives minimal response to exploration of positive change
Discussion moved from positive change to become problem oriented
Therapist emphasises change
Link to deeper meaning
Therapist attempts to find deeper meaning in positive change
Therapist instigates use of formulation
Exploration of positive change by therapist


Thematic map idea 5
Identification of positive change
Identification of positive change by client
Therapist identifies the gain
Therapist asks about specific symptom improvement
Reinforcement of clients positive change by social circle
Exploration of reasons for change
Client directed change
Attributed to therapy or therapeutic skills
Externally attributed
Client assigns reasons to positive change- improved routine
Client assigns reasons to positive change- achievement related
Client assigns reasons to positive change- internally attributed
Positive change linked to change in behaviour
Reinforcement of skills developed in therapy
Reason for change linked to therapy
Reflection on between session task
Client assigns reasons to positive change- natural fluctuations
Client assigns reasons to positive change- social network related
Client assigns reasons to positive change- medication related
Client assigns reasons to positive change- absence of negative events
Client assigns reasons to positive change outside of self
Using the gain
Finding deeper meaning
Therapist attempts to find deeper meaning in positive change
Therapist instigates use of formulation
Learning from the change
Client is realistic about change- not black or white
Instigating learning from positive change
Identifying future goals- keeping momentum
Discussion around goals for remaining sessions
Maintenance of positive change- goals
Client unsure of maintenance of positive change
Client responds by minimising the gain
Client gives minimal response to exploration of positive change
Discussion moved from positive change to become problem oriented
Challenging unhelpful cognitions linked to positive change
Therapist highlights clients development of therapeutic skills
Positive change linked to clients strengths
Keeping focus on the positive
Bringing it back to the gain
Exploration of positive change by therapist
Positive reflections
Positive reflection between past experiences and present
Comparison to state at start of therapy
Review of goals made at start of therapy
Positive feedback
Praise from therapist
Therapist emphasises change
Ending on a positive
Planning for end of therapy

Appendix E

Rational-empirical model checklist

Model Components Checklist

Transcription TiD:

Session:

Model component	Subcomponents	Description	Present?
Identification of positive change		There is a positive change highlighted by the client or therapist or both. This could also include highlighting an actual change in scores or just an observed change in symptoms.	
Reasons for positive change	Client directed change	The client internally attributed the change to something they have	

		implemented or changed.	
	Attributed to therapy or therapeutic skills	The gain is attributed to the therapeutic space or skills developed as a result of attending therapy.	
Keeping with the positive	Bringing it back to the gain	The client or therapist bring the focus of the session back to the positive change.	
	Positive reflections	The therapist and/ or client reflect on how positive the change in themselves is compared to their past. This includes	

		discussing change over course of therapy and meeting goals.	
	Positive feedback	The therapist provides positive feedback to the client in relation to the positive change or the client shared positive feedback they have received from their social circle.	
Using the gain	Finding deeper meeting	The therapist attempts to explore the gain and link the change to a deeper level of change that the client may or	

		may not be aware of such as linking to formulation.	
	Learning from the change	There is a discussion or reference to what can be learnt from the positive change and applied in the future.	
	Keeping momentum	The client and therapists focus moves to becoming about ways to keep the positive change and further improvements	
Ending on a positive		The therapist and/or client brings in discussion around the end of therapy.	

Blocks to maintaining a sudden gain

Theme	Subtheme	Description	Present?
Gain attributed to external factors only		The gain is only assigned to reasons outside of the clients control	
Minimising focus on the gain		The focus of the session moves back to problems rather than being focussed on the gain	
Lack of confidence in the gain		The client is not sure that they can maintain the gain and see it as a temporary change as opposed to progress	

Outcome prediction (highlight the prediction)	
Maintained gain and good outcome	Poorer outcome and potential loss of gain

Appendix F

Ethical approval

The University Of Sheffield.

Downloaded: 18/02/2022
Approved: 21/12/2021

[redacted]
Registration number: 200183622
Psychology
Programme: Doctorate in Clinical Psychology

Dear [redacted]

PROJECT TITLE: How can therapists facilitate an upward spiral following a sudden gain?
APPLICATION: Reference Number 044595

This letter confirms that you have signed a University Research Ethics Committee-approved self-declaration to confirm that your research will involve only existing research, clinical or other data that has been robustly anonymised. You have judged it to be unlikely that this project would cause offence to those who originally provided the data, should they become aware of it.

As such, on behalf of the University Research Ethics Committee, I can confirm that your project can go ahead on the basis of this self-declaration.

If during the course of the project you need to deviate significantly from the above-approved documentation please inform me since full ethical review may be required.

Yours sincerely

Department Of Psychology Research Ethics Committee
Departmental Ethics Administrator

Appendix G

Reflexive statement

Reflexive statement

The researcher identifies as a White-British female from a working-class background. She was raised in an ex-mining community in which employment and education opportunities were poor and there was seemingly a lack of mental health support available despite the high levels of those experiencing mental health difficulties. The researcher has a strong desire to ensure people from underserved or underprivileged backgrounds have access to effective mental health support. At the time of writing, she is a trainee clinical psychologist and working in a community learning disability service where she is aiming to set up a pathway to support individuals with complex mental health needs who enter and leave services regularly, and struggle to hold onto changes made when supported by the service. It is likely that the researcher was drawn to this project due to her interest in maintenance of therapeutic gains. The task analysis approach also aligns with the researcher's value of being a scientific practitioner, ensuring that theories are supported by empirical data and that practice is informed by research.

Within the researcher's clinical practice, she aims to work in a therapeutic modality that is best suited to the client but has historically worked predominantly in cognitive behavioural and cognitive analytical approaches.

Appendix H

Reflexive diary

Reflexive log

Date	Stage of analysis	Reflexive comments
7/10/22	Transcription of pure gold sample started	I found myself feeling very excited as I began to transcribe the first of my four pure gold samples. I think the excitement is partly related to getting to know the data more in depth but also related to the fact that what I'm hearing is seemingly inline with what I was hoping to hear. The fact that I am 'hoping to hear' something informs me that I am perhaps influenced by my background research and understanding of the existing theory as to what therapists 'do' to instigate an upward spiral. I'm thinking that I will hold of writing my introduction and refreshing my knowledge of the initial theory to allow me to approach the data with fresh eyes.
10/10/22	Transcription of pure gold sample continued	I could not help but feel slightly bored in this transcription and feeling possibly annoyed at the pace of the session I was transcribing. It was clear that this was a PCET session, and I wonder if my own personal preference for more directive therapies is influencing my enthusiasm? I need to keep an eye on this in the future as I would not want my interests to influence

		the effort I apply when looking for codes and themes in the data from counselling sessions.
16/10/22	Transcription of pure gold sample continued	I'm coming to the end of my pure gold transcriptions, and I feel hopeful about what I have found, I feel I have really got to know my data through the transcription process and feel that there are some standout themes potentially there. I have recollection of two of the first steps theorised by Aderka and Shalom but have forgotten the last two (at least for now anyway?) and feel this is a positive step before going into the rest of the analysis as I am no longer looking for my data to fit with their theory and I am more interested in what is emerging from what I have listened to.
03/11/22	Transcription of unproductive sample started	I am feeling slightly confused after transcribing my first example of an unproductive sessions. I can't seem to pick out much difference from the previously transcribed 'pure gold' examples. There is definitely a pull in me to want to find something different or a different process that therapists and clients follow in the pure gold examples compared to the less productive examples. Is this unusual though for a researcher? Surely our aim is to build on research and so we want to discover something new. I also wonder if this need to 'discover something' is related to my

		role as a trainee and knowing that this work will contribute to me passing or failing the course. I want it to be interesting and valuable. I think I have realised through this reflection though that finding nothing in terms of difference is also valuable and that there is always something to explore regardless of whether the finding is to be expected or not.
11/11/22	Transcription of unproductive sessions	I am coming to the end of the unproductive transcriptions, and I can't help but notice the continued feeling of boredom or possibly annoyance that I had during the last few transcriptions. I think this is largely related to the lack of content that seemed relevant to my research question. This is something that is potentially important for my findings, is it that the unproductive sessions are less directive and focussed on the gain? Or is my knowledge that they are unproductive sessions shaping my enthusiasm? Considering my earlier reflexive statement about confusion as the first unproductive session was seemingly similar to the pure gold examples, it may be that the remaining unproductive sessions were simply less interesting when considering my research question. I'm noticing that the pressure is building to get the transcriptions finished and I feel I want to move onto analysis, I

		wonder if the pressure of completing a thesis is also influencing my mood towards the process of transcription?
28/11/22	Familiarisation with the data	I noticed that I am feeling very enthused by all of the transcriptions this time around and I feel I am hearing more in-between the lines and thinking about what the therapist is trying to do in saying that rather than focussing on what he is purely saying. It is a really interesting process re-listening to the sessions as I feel I am hearing new things that I did not notice initially. I am shocked by a clear difference in talk about the endings of therapy. I wonder where this shock is coming from, it stands out that each of the 'pure gold' examples are drawing attention to the end of therapy. I think in my practice, I am currently working with individuals who attract a personality disorder diagnosis and for whom an ending is a very sensitive topic, and it needs to be done with sensitivity and a long ending planned. I think that my own preference for bringing in an ending with the current client group I am working with clashes with how blasé it appears to be mentioned in the sessions, that is possibly the reason for my shock.
05/12/22	Starting of coding process	The codes are taking much longer than I had expected. I want to work efficiently and to the time pressures of

		completing a doctorate thesis but also, I think I am feeling a pull to get this right. I want to make sure that I am capturing the right information so that it can inform clinician's practice. I think I really value the direct link between this piece of research and clinical practice, and I want it to be the most accurate and thorough piece of work possible. I will continue to take my time and immerse myself in the data to ensure that the codes are well thought through.
09/12/22	Continuation of coding	I'm noticing that it is difficult for me to leave areas of the transcript uncoded. I am feeling stuck and having to remind myself of the research question. I think I see the value in the data and want to capture as much as possible to ensure that the therapists hard work and clients own process are accounted for. I think I identify with the hard work the therapists and clients put into each session and do not want their efforts to be missed. However, there must be a balance and I cannot simply capture every little thing in the transcript as most of some transcripts are not related to the gain at all. It is important to remind myself that the research question is best answered when only the relevant data is coded.
19/12/22	Continuation of coding	I have moved onto the coding of the unproductive examples and some of them are largely unfocussed on

		the gain and so there is very little for me to code. I feel uncomfortable missing out whole pages of text which links into how I was feeling in the previous weeks. I think there is a relation for me between time and effort and if something takes little time I feel I have not made an effort. It is noticing that I want to analyse something where there is really nothing relevant to my research question and actively challenging this that is key.
3/01/23	Continuation of coding	I've coded all of my initial eight transcripts and have found a range of codes that I can already see will form some key themes. I am noticing thought that my codes are quite broad. I wonder if I have become focussed on the next stage of analysis and unconsciously began to form possible themes instead of coding what is exactly happening in the data. I have gone back through the data and add in relevant codes that are more precise in nature. My excitement of understanding the overall themes in the data and creating a model is likely the reason for this.
9/01/23	Coding until no more codes are found	I have found that no more codes are being generated after analysing a further two extra transcripts. I noticed that I felt anxious at this prospect and have actively read through the transcripts a few more times to ensure that nothing new can be observed. I think

		this is more related to my worry of not capturing enough data and feeling that I have not done the client or therapist justice.
16/01/23	Putting codes into themes	I found that I was wanting to look back over the initial theory proposed by Aderka and Shalom (2021) before starting to put my codes into overarching themes. I actively chose not to in hope that this would have less influence over the final development of themes. It is hard to ignore my prior knowledge however and recall of the first two parts of the theory which were to identify the gain and look for reasons for the gain. I am aware that two of my themes are exactly that. I then found myself wanting to find a different way of categorising these themes to argue that I have not been influence by bias. I have attempted to reorganise the codes into a range of themes but it is clear that identification and reasons for the gain are themes. It would be interesting to see how the themes fair in an audit conducted by another researcher separate to the project.

Appendix I

Eight "Big-Tent" criteria for excellent qualitative research.

Worthy Topic	
1. Is the topic of research relevant and justified?	(Yes) / Partially / No
2. Is the topic conducted in a time where it is useful?	(Yes) / Partially / No
3. Is the topic the topic significant and meaningful to the research area/clinical practice?	(Yes) / Partially / No
Rich Rigor	
4. Does the study include clear theoretical constructs?	(Yes) / Partially / No
5. Does the study comprise of rich data?	(Yes) / Partially / No
6. Does the study describe the sample and provide demographic information?	Yes / (Partially) / No
7. Is the sample appropriate for answering the research questions?	(Yes) / Partially / No
8. Does the study describe how a sudden gain is conceptualised (e.g sudden gain criteria)?	(Yes) / Partially / No
9. Does the study sufficiently justify and describe the data analysis process?	(Yes) / Partially / No
10. Has the data been thoroughly coded adhering to the chosen analysis (6 steps to thematic analysis)?	(Yes) / Partially / No
11. Has the researcher engaged in a reflexive process to define personal and group experiential themes?	(Yes) / Partially / No

Sincerity	
12. Does the researcher record self-reflexivity including values, biases, and personal experiences that may impact their interpretation of themes from sessions where clients are in treatment for depression?	(Yes) / Partially / No
13. Has the researcher documented research decisions and activities that were undertaken?	(Yes) / Partially / No
14. Does the research address the chosen methods limitations?	Yes / (Partially) / No
Credibility	
15. Are participant quotes evidenced for themes and sub-themes?	(Yes) / Partially / No
16. Has the researcher engaged in appropriate supervision to support research quality?	(Yes) / Partially / No
17. Has the researcher made use of other researchers to understand possible different perceptions of the same data?	(Yes) / Partially / No
18. Did the researcher attempt to seek input from the participants during the analysis?	Yes / Partially / (No)
Resonance	
19. Are the research findings documented clearly and insightfully?	(Yes) / Partially / No

20. Are the findings transferrable to other areas of practice or research?	(Yes) / Partially / No
Significant Contribution	
21. Does the study extend current knowledge of sudden gains and how they impact therapeutic outcomes?	(Yes) / Partially / No
22. Do the study's provide implications clinical practice?	(Yes) / Partially / No
23. Does the study make recommendations for research?	(Yes) / Partially / No
24. Does the study make contributions to existing theory?	(Yes) / Partially / No
Ethical	
25. Does the research have ethical approval?	(Yes) / Partially / No
26. Are the participants experiences appropriately represented?	(Yes) / Partially / No
27. Does the research share the results in a way that is compassionate to and mindful of the participants?	Yes / (Partially) / No
Meaningful Coherence	
28. Does the study achieve its reported aims?	(Yes) / Partially / No
29. Does the study relate its findings with previous research?	(Yes) / Partially / No
30. Did the methodology support the aims of the study?	(Yes) / Partially / No

Name of Researcher XXXXXX XXXXXXXX **Researcher Signature**

Name of Auditor XXXXXXXX XXXXXXX **Auditor Signature** CGrahame