The immediate psychological effects of written solution-focused questions in female secondary school students.

ABDULLA, A.

2023

The Immediate Psychological Effects of Written Solution-Focused Questions in Female Secondary School Students

Adam Abdulla

A thesis submitted in partial fulfilment of the requirements of the Robert Gordon University for the PhD by Public Output

April 2023

Abstract

Background

The popular literature assumes that solution-focused (SF) questions have positive effects on variables such as expectancy and commitment (which are crucial for goal attainment). Typically contrasted with problem-focused (PF) alternatives, SF questions/techniques were originally developed in family therapy and deployed in face-to-face interactions. However, they are now commonly used in educational contexts and frequently delivered through writing. It is therefore important to examine the effects of written SF/PF questions/techniques on students' expectancy and commitment.

Content of Thesis

There are two parts to this thesis. The first part is a systematic review of experimental studies published between 1988 and 2020 investigating the effects of written SF (and PF) questions on students' expectancy and commitment. The aim of this review is to clarify what was known before the author's[1] first publication.

The second part of the thesis outlines some of the contributions of the author's public output, which (for the purposes of this PhD) consists of 6 papers, all of which were published in peer-reviewed journals between 2021 and 2022. Each paper reports at least one randomised controlled experiment examining the impact of written SF questions in female secondary school students.

Findings

The systematic review reveals several important limitations in the evidence base that existed before the author's publications. Those limitations include (i) the use of undergraduate samples (only), (ii) the absence of commitment from the dependent variables, and (iii) the failure to isolate particular questions/techniques.

The author's publications contribute to the literature by (i) reporting results obtained with *secondary school* students, (ii) illuminating the effects of SF questions on students' goal commitment, (iii) examining the impact of particular SF questions/techniques, and (iv) highlighting the importance of ease-of-retrieval/difficulty-in-generation (i.e. students' experience of ease/difficulty in responding to SF questions). The findings reported in the author's public output include the following: (1) the positive effects of written SF questions on students' expectancy and commitment are likely to be more modest than the popular literature suggests; (2) compared to PF questions, some SF questions may have positive indirect effects on goal commitment by enhancing students' expectancy; (3) compared to PF questions, some SF questions may also have *negative* direct effects on commitment, and (4) when students are asked SF questions, their expectancy/perceived self-efficacy may be affected by the ease/difficulty experienced in generating a response.

Conclusion

The author's public output indicates that certain written SF techniques may have some positive effects on expectancy and commitment, but these effects are probably small or moderate rather than large. Moreover, the author's publications suggest that solution-focused practitioners should also consider the impact of ease-of-retrieval / difficulty-in-generation. Collectively, the author's studies suggest that it would be unwise to treat written SF techniques as "magic bullets." More obviously positive effects may (perhaps) be achieved in longer interventions including *multiple* SF questions and/or face-to-face interactions.

Table of Contents

Chapter 1: Introduction …….. 6

Solution-Focused Approaches with Students ……..... 7

SF Techniques Delivered Through Writing ……..…… 7

Expectancy, Commitment and SF Questions/Techniques …… 8

Chapter 2: Systematic Review ……..... 10

Methods ……..…… 10

Results ……..…… 15

Brief Discussion ……..…… 20

Chapter 3: Contributions of Public Output ……... 22

Contribution 1: Illuminating the Effects of SF techniques in *Secondary School* Students…….. 22

Contribution 2: Illuminating the Impact of SF Questions on *Commitment* (as well as Expectancy) …… 23

Contribution 3: Investigating the Effects of *Specific* (Types of) Questions …… 25

Contribution 4: Highlighting the Importance of Ease-of-Retrieval Difficulty-in-Generation ……..... 27

Overall Contributions & Limitations of the Author's Public Output… 28

Conclusion ……. 33

References ……..…….. 35

Endnotes ……..…….. 50

Appendices …… 58

Appendix A: Solution-Focused Approaches and Techniques …… 58

Appendix B: Search Terms Used in the Literature Search for the Systematic Review ……. 61

Appendix C: Flow Diagram Depicting Results of Each Stage in the Literature Search for the Systematic Review……. 64

Appendix D: Data Extraction Form Used in the Systematic Review. 65

Appendix E: Studies Meeting Several but not All Inclusion Criteria.. 68

Appendix F: Characteristics of Studies Included in the Systematic Review …….. 69

Appendix G: Summary of the Results of the Risk of Bias Assessment for Studies Included in the Systematic Review …… 71
Appendix H: Summary Data for Experimental Conditions and Estimated Effect Sizes in Included Studies ……..… 73
Appendix I: Solution-Focused and Problem-Focused Questions Originally Compared by Grant (2012) …… 76
Appendix J: Publications Included in Author's PhD Portfolio…… 77
Appendix K: Progression from Study to Study ……... 79

Acknowledgements

I would like to thank my supervisors - Ruth Woods, Francis Quinn, and Katrina Forbes-McKay - for taking the time to read through my work and for providing numerous extremely valuable suggestions. I am immensely grateful for the support they have provided not only throughout this PhD but also throughout my Master's Degree. I would also like to thank all of the students who participated in the research and all of the teachers and leaders who enabled me to carry it out.

Chapter 1: Introduction

Solution-focused (brief) therapy was developed by Steve de Shazer, Insoo Kim Berg and their colleagues at the Brief Family Therapy Centre in Milwaukee in the 1980s (de Shazer, 1988). It was later adapted for use in non-therapeutic contexts, for example as solution-focused coaching (e.g. O'Connell et al., 2012). In the context of coaching, solution-focused (SF) approaches are primarily designed to facilitate goal attainment rather than to alleviate distress (Sanderfur, 2014). SF approaches focus on people's strengths, resources and success. They are often contrasted with problem-focused (PF) approaches, which address people's weaknesses, obstacles and *lack* of success (Davis & Osborn, 2013; O'Connell et al., 2013). Table 1 in Appendix A presents several classic SF approaches and contrasts these with PF alternatives. Proponents often argue that SF approaches raise people's (goal attainment) expectancy[2] - the extent to which individuals expect to attain goals - and (goal) commitment[3] - the extent to which individuals are committed to attaining goals (e.g. Ratner et al., 2012; Reiter, 2010; Wilson, 2020).

Importantly, SF approaches pride themselves on being "brief." Indeed, many proponents claim that SF approaches can deliver *immediate* results (e.g. Jackson & McKergow, 2011). Iveson (2018, p.153) states that in "solution-focused brief therapy, single-session transformations are common enough not to be a surprise." Similarly, advocates of SF coaching suggest that substantial progress can be made within a single session (e.g. Ratner et al., 2012).

Table 2 in Appendix A presents some of the commonest questions/techniques used in SF interventions. These questions/techniques are widely championed in the popular literature. For example, scaling questions are described as "extremely useful" (Lutz, 2014, p.78), "very effective" (Meier, 2005, p.109) and as "powerful tools" (Steenbarger, 2018, p. 212). More specifically, commentators assert that scaling questions raise expectancy and commitment (e.g. Hepworth et al., 2017; O'Connell, 2001; Thomas, 2013). The "Miracle Question" has been described as "one of the most powerful interventions there can be" (Winbolt, 2011, p. 119). It too is often said to raise expectancy (e.g. Reiter, 2010). The virtues of the other SF questions/techniques presented in Table 2 (Appendix A) have been similarly extolled by commentators.

Solution-Focused Approaches with Students

SF approaches have been used in schools since the 1990s (Franklin et al., 2012). Teachers have increasingly drawn on SF questions/techniques, sometimes with the support of school psychologists (Niu & Niemi, 2020; Simm & Ingram, 2008; Simmonds, 2019). Qualitative interviews and case studies indicate that school professionals consider SF questions/techniques to be some of the most powerful tools in their arsenal (Atkinson & Amesu, 2007; Doveston & Keenaghan, 2010; Franklin et al., 2012). Self-report data suggest that children too consider SF questions to be helpful (e.g. Grandison, 2007).

Evidence suggests that multisession SF interventions may be effective with students. For example, the SF intervention known as “Working on What Works” has been implemented with success in numerous schools in both the US and UK (Berzin et al., 2012; Wallace et al., 2020). Solution-focused interventions are also used in universities and colleges (Seko & Lau, 2021). For example, SF interventions have been used to help students with doctoral dissertations (Johnson & Conyers, 2001). Moreover, specific techniques such as scaling questions are used in the supervision of doctoral students (Walsh et al., 2018).

SF Techniques Delivered Through Writing

SF therapy was originally developed as a face-to-face intervention. SF coaching also typically involves interaction with another human being (i.e. the coach). However, SF questions/techniques are now frequently delivered through writing. For example, Richmond et al. (2014) report positive effects of SF questions presented in a short counselling intake form. Clients who answered SF questions described more solutions and fewer problems than clients answering problem-focused questions. SF questions are also embedded in many written/computerised self-help tools (Cepukiene & Pakrosnis, 2018; Isherwood & Regan, 2005; Kramer et al., 2014; Pakrosnis & Cepukiene, 2015). Some of these tools are designed specifically for students (e.g. Pakrosnis & Cepukiene, 2015). Experimental research on SF (and PF) questions has also used written delivery (e.g. Grant & O’Connor, 2010; Theeboom et al., 2016).

The advantages of written delivery (over face-to-face interventions) include scalability, ease-of-access and cost-effectiveness (e.g. Rost et al., 2020). For

example, a school can disseminate SF questions to its entire student body via a single email. This is considerably less expensive (and may even be more efficient) than training teachers in face-to-face coaching. Moreover, some students *prefer* computerised (to face-to-face) interventions (Cepukiene & Pakrosnis, 2018). It is therefore important to examine the effects of SF techniques in written/computerised formats.

Expectancy, Commitment and SF Questions/Techniques

Solution-focused coaching is often described as "light on theory" (O'Connell et al., 2012, p.36). Nevertheless, given its focus on goal attainment, its relationship to goal-setting theory should be considered. The primary contention of goal-setting theory is that specific, challenging goals lead to higher levels of performance (Locke & Latham, 2013). However, the relationship between goals and performance is moderated by goal *commitment* (Klein et al., 2013). Challenging goals lead to higher levels of performance (only) when goal commitment is high (Klein et al., 1999). As already noted, advocates of SF approaches claim that SF questions/techniques (e.g. scaling questions) naturally build commitment (e.g. O'Connell et al., 2012). The systematic review in Chapter 2 attempts to investigate that claim.

One of the primary determinants of goal commitment is (goal attainment) *expectancy* (Klein et al., 2013). If individuals do not expect to attain a goal, then they are unlikely to be committed to attaining it (Locke et al., 1988). Conversely, high levels of expectancy are associated with high levels of commitment, particularly in the early stages of goal pursuit (Huang et al., 2017). As explained above, many commentators claim that SF questions/techniques are effective in raising expectancy (e.g. Reiter, 2010). That claim is also examined in Chapter 2.

Advocates generally do not explain *why* SF questions/techniques should raise expectancy and commitment. This silence stems from the absence of theory in most solution-focused work. However, Bandura's theory of perceived self-efficacy appears relevant (Bandura, 1997). According to Bandura, the primary sources of perceived self-efficacy include an individual's own "mastery experience" (i.e. previously achieved success) and verbal/social persuasion from others. Inspection of Tables 1 and 2 in Appendix A suggests that SF practitioners may be relying on those sources when using SF questions/techniques. For example, in examining previous success and asking questions about "exceptions", SF practitioners are effectively focusing on

clients' "mastery experience." Meanwhile, in giving their clients "compliments," they are providing a form of verbal/social persuasion. Bandura's theory suggests that in both cases perceived self-efficacy should be raised. Although perceived self-efficacy is not (for Bandura) identical to expectancy, the two constructs are clearly related (Klein et al., 2013). Whatever enhances perceived self-efficacy may therefore enhance expectancy as well. Given the strong positive relationship between expectancy and commitment, SF questions/techniques that enhance expectancy may then also indirectly enhance commitment.

SF techniques may also enhance expectancy and commitment by creating or activating desired "possible selves." "Possible selves" refer to the ideas that individuals have about what they *might* become, what they would *like* to become and what they are worried about becoming (Markus & Nurius, 1986). Both theory and research suggest that "representations of the self in a desired end state may create and sustain motivation" (Norman & Aron, 2003, p. 501). Several SF techniques do in fact involve "representations of the self in a desired end state." For example, the "Miracle Question" invites individuals to imagine a scenario in which their problems are solved and a desired goal has been achieved. The "Miracle Question" is similar to Positive Psychology's "Best Possible Self" intervention, which appears to raise expectancy (e.g. Peters et al., 2010) and commitment (e.g. Altintas et al., 2012). The Miracle Question may therefore enhance expectancy and commitment by creating/ activating a desired "possible self."

In summary, there are some theoretical reasons for thinking that (written) SF questions/techniques may indeed have positive effects on expectancy and commitment. The systematic review in the following chapter examines the *empirical* evidence for such effects.

Chapter 2: Systematic Review

Previous systematic reviews and meta-analyses have focused on multi-session SF interventions delivered to students (or others) in person (e.g. Bond et al., 2013; Franklin et al., 2020; Gingerich & Peterson, 2013). No previous systematic review has focused on single-session SF questions/techniques delivered in writing (or, for that matter, in person). In the introduction to their own study on SF/PF questions, Grant and O'Connor (2018) do briefly review previous studies of written SF questions. However, brief narrative reviews are generally regarded as more subjective and less informative than a thorough systematic review (e.g. Petticrew & Roberts, 2006). Moreover, Grant and O'Connor (2018) ignore unpublished studies and pay little attention to the limitations of previous research. What is known about the effects of written SF questions on expectancy and commitment has therefore not yet been adequately summarised. The present systematic review was designed to redress that deficiency.

Formulated in terms of the PICO model - "Population," "Intervention," "Comparison" and "Outcomes" (Petticrew & Roberts, 2006) - the primary review question was as follows: *"What are the effects of single-session, written solution-focused (vs. problem-focused/neutral) questions on students' expectancy and commitment?"* Three of the "PICO" components in the question above have already been discussed: "Population" (students), "Intervention" (SF questions) and "Outcomes" (expectancy and commitment). For the final element ("Comparison"), *problem-focused* (PF) techniques were the primary target since SF approaches are commonly contrasted with PF alternatives. However, studies comparing SF questions with "neutral" alternatives (e.g. questions that are neither solution- nor problem-focused) were also considered to be relevant. The PRISMA guidelines for systematic reviews (Page et al., 2021) were followed as far as the constraints of a PhD by publication would allow.

Methods

Eligibility Criteria

Studies were included if they met the following criteria: (1) SF questions/techniques were compared against either PF questions/techniques or

neutral questions/techniques (2) participants were randomly assigned to conditions; (3) participants were students (of any age); (4) questions/techniques were delivered in writing (not face-to-face); (5) the intervention consisted of a single session; (6) dependent variables included expectancy (or a closely-related variable, e.g. perceived self-efficacy) and commitment (or a closely-related variable, e.g. motivation); (7) the study write-up was published between 1988 (the year in which de Shazer's book "Clues" was released, which contains one of the earliest formulations of the "Miracle Question") and 2020 (the year before the author's first paper was published); (8) enough information was provided to estimate an effect size; (9) the study report was in English. Both published and unpublished studies were eligible. Studies meeting the inclusion criteria were later grouped on the basis of similarities (e.g. experimental design, intervention materials, and dependent measures).

Information Sources

Two online databases were used - Google Scholar and Web of Science. Searches were conducted on Google Scholar between the 30th March 2022 and the 27th of April 2022. Searches were conducted on Web of Science between the 27th of April 2022 and the 3rd of May 2022. The search terms that were used are listed in Appendix B. If an otherwise unobtainable thesis published on Proquest appeared as an abstract in Google Scholar/Web of Science *and* seemed to meet the eligibility criteria, access to the full thesis was sought at the British Library. In addition, corresponding authors of published studies (meeting the inclusion criteria) were contacted and asked for any relevant unpublished data. Reference lists of included studies were also examined for other potentially relevant studies.

Search Strategy

Each search string was run separately in Google Scholar and Web of Science. Quotation marks were used in Google Scholar to increase the precision of the search. The strategy was then as follows. The titles and snippets of all results (from each search) were initially examined for relevance. Any result that appeared to be relevant was added to an Excel list. Duplicates were then removed from that list. The abstracts of all remaining results were then read. If an abstract suggested that a

report might meet the inclusion criteria, an attempt was made to access the full report.

Selection Process

Each potentially relevant result was screened by the author alone, who applied the inclusion criteria in the order in which they are listed above (see "Eligibility Criteria"). The flow diagram in Appendix C provides an overview of the search and selection process.

Data Collection Process

If a report described a study meeting the inclusion criteria, a data extraction form was completed (see Appendix D). Attempts were made to contact authors if reports lacked important information.

Data Items

The outcomes for which data were sought were expectancy and commitment. Variables were considered to be (potentially) synonymous with "expectancy" and "commitment" only if they were goal-directed. Thus, "motivation" was accepted as a synonym for "commitment" only if it designated motivation *to attain a particular goal.* "Motivation" in the sense of undirected arousal (e.g. a feeling of being "energised") was not considered relevant. The other types of information extracted from each study are listed in Appendix C. If data were reported for multiple time points, only those data recorded immediately after the intervention were extracted. In order to facilitate comparisons between SF and PF (or SF and neutral) techniques, data reported for *combined* conditions (i.e. SF+PF) were ignored. Goal-focused research (particularly in education) often contrasts "approach goals" (e.g. to pass an exam) with "avoidance goals" (.e.g. to avoid failing an exam) (Elliot, 1999). In studies including both types of goal, data for "Approach goals" were considered to be of primary importance. "Approach goals" are very much in keeping with the solution-focused ethos. On the other hand, SF interventions and indeed coaching in general normally eschew "avoidance goals."

Study Risk of Bias Assessment

The Revised Cochrane risk-of-bias tool for randomised trials was used to evaluate the quality of included studies (Sterne et al., 2019).

Effect Measures

The following effect size estimates were calculated: (i) the raw mean posttest difference (= SF posttest mean – PF posttest mean); (ii) the raw pretest posttest effect size estimate (= [SF posttest mean – SF pretest mean] – [PF posttest mean – PF pretest mean]); (iii) the standardised mean posttest difference/Cohen's *d* (= the raw mean posttest difference / pooled pretest standard deviation); (iv) standardised pretest posttest effect size estimate (= the raw pretest posttest effect size estimate / pooled pretest standard deviation). In all cases, positive values indicate an advantage for the SF (over the PF) condition.

Synthesis Methods

One of the commonest criticisms of meta-analysis is that it (often) combines "apples and oranges" (Card, 2015). Quantitative synthesis was therefore reserved for studies that were conceptually, methodologically and experimentally homogeneous. Specifically, meta-analyses were conducted of studies that used precisely the same experimental design, precisely the same measures for the dependent variables, and precisely (or *almost* precisely) the same SF (and PF) questions. In other words, the meta-analysed studies were essentially exact replications. In such a situation, a "fixed-effect" meta-analysis may be appropriate (e.g. Harrer et al., 2021). The fixed-effect model (which assumes that all studies share a common "true" effect) was therefore adopted.

Two sets of "fixed-effect" meta-analyses were conducted. The first set involved posttest data only and used raw mean posttest differences. The second set involved both pretest and posttest data and used raw pretest posttest effect size estimates. The weight for each study was calculated as the inverse of the estimated sampling variance of that study's effect size estimate. Weighted means and confidence intervals were calculated using standard formulas (Borenstein et al., 2009; Morris, 2008). Raw effect size estimates were used in all meta-analyses

because of the problems of comparing standardised effect size estimates (Simpson, 2018). Meta-analysis of raw differences requires all studies to use precisely the same measure and scale. Consequently, studies were meta-analysed only if they appeared to meet that requirement.

The second set of meta-analyses (involving both pretest and posttest data) require correlations (*r*) between pretest and posttest data for the calculation of the estimated standard error (see Morris, 2007). If such correlations were not reported, reasonable values for *r* were imputed (i.e. values that could be calculated from any relevant available data). Sensitivity analyses were then conducted by varying the value of *r*. Many methodologists suggest that moderator analyses (in meta-analysis) require at least ten studies for each putative moderator (Littell et al., 2008). Since the meta-analyses included fewer than ten studies, no moderator analyses were conducted. The *Q* statistic was used to investigate potential heterogeneity of effects. A statistically significant *Q* value is normally taken to suggest that the studies do not all share a common "true" effect (i.e. that true effects differ across studies). It should be noted, however, that when there are only a few studies involved this test is likely to be underpowered (Borenstein et al., 2009). A "non-significant" *Q* value should therefore not be taken as "proof" that all studies are estimating the same true effect.

Reporting Bias Assessment

Publication bias (i.e. the publication of studies with statistically significant results and the non-publication of studies with "null" findings) can undermine any systematic review and/or meta-analysis. The methods commonly used to assess the risk of bias associated with missing results require "a reasonable number of studies" (Borenstein et al., 2009, p. 291). In the present systematic review, only a very small number of studies met all inclusion criteria. It was therefore not possible to use typical methods (e.g. funnel-plots) to assess the risk of publication bias. Published and unpublished studies were compared in terms of effect size estimates but with so few studies in each of the two categories ("published" and "unpublished") the results of such a comparison are limited.

Certainty Assessment

The GRADE system was used to assess the "certainty" or strength of the evidence (Guyatt et al., 2008). Four verdicts are possible: "high", "moderate", "low", and "very low". Evidence based on randomised controlled trials is initially considered to be of "high" quality but may be downgraded for (at least) one of five reasons: (i) study limitations, (ii) inconsistency of results, (iii) indirectness of evidence; (iv) imprecision, and (v) reporting bias.

Results

Study Selection

The results of each stage of the literature search (including the identification, screening and selecting of studies) are depicted in the flow diagram in Appendix C Eight studies ultimately met all the inclusion criteria and were included in the review. Examples of studies meeting several but not all inclusion criteria are provided in Appendix E.

Study Characteristics

Wehr (2010, Experiment 2) involved a posttest-only design. The other seven included studies used prettest posttest comparison group designs with PF conditions as the comparisons (Asai, 2017; Braunstein & Grant, 2016; Grant, 2012; Grant & Gerrard, 2020; Grant & O'Connor, 2018; Neipp et al., 2016a, Neipp et al., 2016b). Six of the included studies were reported in published journal articles (Braunstein & Grant, 2016; Grant & Gerrard, 2020; Grant & O'Connor, 2018; Neipp et al., 2016a, Wehr, 2010). The two other included studies were described in poster presentations (Asai, 2017; Neipp et al., 2016b). No study included a measure of goal commitment (or motivation). All studies involved undergraduates and at least six involved psychology students (Braunstein & Grant, 2016; Grant, 2012; Grant & Gerrard, 2020; Grant & O'Connor, 2018; Neipp et al., 2016a; Wehr, 2010). Sample sizes ranged from 80 to 512. All studies included a measure of expectancy (vel sim[4]). Appendix F summarises the characteristics of the included studies.

With one exception (Wehr, 2010), all of the studies presented students with a

battery of SF or PF questions. The batteries used by Grant (2012) are presented in Appendix I. Braunstein and Grant (2016) do not present the full batteries but the examples of questions that they provide in their paper suggest that they used the same batteries as Grant (2012). Grant and O'Connor (2018) list three PF questions, which are identical to the last three questions in Grant's (2012) PF battery. The SF questions listed by Grant and O'Connor (2018) are identical to Grant's (2012) SF battery. Grant and Gerrard (2020) provide exactly the same questions/battery as Grant and O'Connor (2018). Two studies took place in Spain (Neipp et al., 2016a, 2016b) and used Spanish translations of Grant's (2012) SF/PF batteries. Similarly, Asai (2017) presented students with Japanese translations of Grant's (2012) batteries. In six of the studies, therefore, the (batteries of) SF/PF questions were identical to (or based on) the batteries provided by Grant (2012).

The first question in Grant's (2012) SF battery ('Think about a possible solution to the problem you have just described. Now, imagine a solution had somehow 'magically' come about. Describe the solution') may be regarded as a condensed or truncated version of the 'Miracle Question.' The second question in that battery ('Describe some ways you could start to move towards creating this solution") could be regarded as a form of the 'small steps' technique (see Table 2 in Appendix A). The remaining questions in Grant's (2012) SF battery do not fall easily into any of the familiar categories listed in Appendix A.

Wehr (2010) does not provide the wording of the questions used in his study but reports that students were asked either to list examples of a particular problem (the PF condition) or to list 'exceptions*'* to the problem. Thus, unlike the other studies (which presented students with batteries of questions), Wehr (2010) appears to have presented students with a single type of SF question – questions about 'exceptions' (see Appendix A).

Risk of Bias in Studies

Application of the Revised Cochrane Risk-of-Bias tool led to an overall assessment of "some concerns" for all studies. The risk of bias was deemed to be low in all studies in terms of randomisation, deviation from intended interventions, and measurement of the outcome. There were some concerns with regard to reported outcomes in Neipp et al. (2016b): perceived "goal attainment" was apparently measured but no outcome data for this variable were reported. Only Wehr (2010) reported the number of participants who failed to complete the study, which

meant that there were some concerns about missing outcome data in all other studies. Appendix G summarises the results of the risk-of-bias assessment.

Results of Individual Studies

As indicated, no studies measured commitment. For expectancy (vel sim), point estimates were positive in all cases except for “confidence” in the “1 situation” condition in Wehr (2010) and the pretest posttest effect size estimates for “self-efficacy” in Asai (2017). Thus, in almost all cases SF conditions appeared to lead to greater expectancy than PF conditions. If the unpublished study reported by Asai (2017) is excluded, standardised pretest posttest effect size estimates ranged from 0.18 to 0.89. If these estimates are interpreted according to Cohen’s (1988) criteria, they include small, medium and large effects. Comparing standardised effect size estimates can be misleading when there are between-study differences in outcome measures, standard deviations and a number of other factors (Simpson, 2018). Some readers may therefore prefer to consult the summary statistics and raw effect size estimates displayed for each study in Appendix H.

Results of syntheses

“Self-efficacy” - Five studies apparently used the same 3-item “self-efficacy” measure on the same 1-6 scale (Asai, 2017; Braunstein & Grant, 2016; Grant, 2012; Neipp et al., 2016a; Neipp et al., 2016b). Meta-analysis of posttest data from the aforementioned studies yielded a weighted mean of 1.14, 95% CI [0.57, 1.71]. Thus, on average, SF conditions resulted in total “self-efficacy” scores just over 1 point higher (and mean “self-efficacy” scores just over ⅓ of a point higher) than PF conditions[5]. The 95% confidence interval indicates that this estimated effect was statistically different from zero. There was little statistical evidence for heterogeneity of effects across studies (Q = 1.69, p = .79).

Inspection of pretest data revealed that in Asai’s (2017) study, mean “self-efficacy” was considerably higher[6] at pretest in the SF than in the PF condition (presumably an accident of randomisation). The meta-analysis was reconducted without the study reported by Asai (2017) in order to examine the sensitivity of the results. This yielded a weighted mean of 1.10, 95% CI [0.77, 1.43]. Thus, results were barely affected.

The same five studies were included in the second set of meta-analyses, which used raw pretest posttest effect size estimates. Pretest-posttest correlations

were not reported in any of the study write-ups. However, raw data were obtained for the study reported by Asai (2017), from which the pretest-postest correlation was calculated (r = .78). That correlation was then used for the other four studies in the calculation of (estimated) standard errors. Meta-analysis then yielded a weighted mean of 1.21, 95% CI [0.87,1.56]. In other words, on average, the pre-to-post improvement in total "self-efficacy" scores appeared to be approximately 1¼ of a point greater in SF than in PF conditions. However, there was evidence of heterogeneity of effects (Q = 13.71, p = .008). The outlier in terms of effect size estimates was Asai (2017). The raw pretest posttest effect size was estimated to be in the 1.24-1.96 range for all other studies. However, for Asai (2017), the estimate was extremely small and negative -0.02, 95% CI [-0.078,0.74]. When the meta-analysis was conducted without that study, there was no longer any strong statistical evidence of heterogeneity (Q = 5.29, p = .15).

The meta-analysis was reconducted in order to examine whether results were sensitive to the (imputed) value of the correlation (see Borenstein et al., 2009). When r was assumed to be .5 (rather than .78) the weighted mean was essentially identical: 1.21, 95% CI [0.69, 1.74].

"Goal Approach" - Three studies appeared to measure "goal approach" (i.e. the extent to which students considered themselves close to attaining their goals) on the same 0 to 10 scale (Grant, 2012; Grant & O'Connor, 2018; Neipp et al., 2016a). Meta-analysis of posttest data from the aforementioned studies yielded a weighted mean of 0.56, 95% CI [0.19, 0.94]. Thus, on average, SF conditions resulted in "goal approach" scores approximately half of a point higher than PF conditions[7]. Once again, the estimated effect was statistically different from zero. There was no strong (statistical) evidence of heterogeneity of effects (Q = 3.37, p = .19).

The same three studies were meta-analysed in the second set of meta-analyses, which used raw pretest posttest effect size estimates. Pretest-posttest correlations were not reported in any of the study write-ups. The author was not able to obtain any raw data (for any of the studies) from which the correlations could be calculated. The values used in the analyses for "self-efficacy" (r = .78 and r = .50) were therefore imputed. When the correlation was assumed to be .78, the weighted mean was 0.47, 95% CI [0.21, 0.73]. Thus, the pre-to-post increase in "goal approach" appeared to be approximately half a point greater in SF than in PF conditions. There was no statistical evidence of heterogeneity (Q = .13, p = .94).

When the correlation was assumed to be .5, the weighted mean was essentially identical: 0.47, 95% CI [0.08, 0.86].

Reporting Biases

Pretest-posttest effect size estimates for the studies in published write-ups were considerably larger than those for one of the unpublished poster presentations (Asai, 2017). Data for Asai (2017) were in fact only obtained only by chance[8]. With so few studies included in the review, it was not possible to compare the five published and two unpublished studies statistically. However, the extremely small (and partially negative) effect size estimates calculated for Asai (2017) highlight the possibility of publication bias.

Certainty of Evidence

Expectancy - All of the included studies provided evidence regarding effects (of written SF/PF questions) on students' goal attainment expectancy. The studies had many strengths, including (relatively) large sample sizes and pretest measurements, both of which help to increase the precision of estimated effects. There were some limitations in all of the studies (e.g. the failure to report the number of participants who did not complete all outcome measures). However, those limitations were not deemed sufficient (on their own) for a downgrading of the evidence.

GRADE may also lead to downgrading if results across studies are inconsistent. However, downgrading is not inevitable if a plausible explanation for the inconsistency can be found (Higgins et al., 2022). In the present review, estimated effects in Asai (2017) were not consistent with those in the other studies. Asai's (2017) study was conducted with Japanese (rather than "Western") students. Cultural differences may therefore explain the inconsistent results. Rather than undermining the strength of the evidence provided by the other studies, Asai's (2017) study may simply indicate that written SF/PF questions have different effects depending on culture/nationality. When Asai's (2017) study was omitted from meta-analyses, effect size estimates were generally consistent. The quality of the evidence was therefore not downgraded on the basis of "inconsistency."

Evidence was "direct" insofar as studies directly compared the effects of written SF and PF questions on students' (goal attainment) expectancy. However, all studies involved undergraduate students only. Thus, evidence for effects on *other*

types of students (e.g. secondary school students) was, at best, indirect. In addition, the study by Asai (2017) highlights the risk of publication bias, which also leads to a downgrading of the strength of the evidence. These considerations led to a downgrading of the evidence to “moderate.”

Brief Discussion

In the studies included in the systematic review, SF questions appear to have been more effective than PF questions in raising expectancy (referred to as “self-efficacy” or “goal approach”). PF conditions were associated with pre-to-post improvements in total “self-efficacy” scores of approximately a third to a half of a point (see Appendix H). If Asai’s (2017) study is ignored, SF conditions were associated with pre-to-post improvements in total “self-efficacy” scores of approximately two points. With Asai’s (2017) study again excluded, SF conditions were also associated with a greater pre-to-post improvement (than PF conditions) in “goal approach”. Together these results suggest that written SF questions are more effective than PF alternatives in raising (university) students’ expectancy. Nevertheless, the included studies have several important limitations.

First, all studies involved undergraduate students only. It may be unwise to assume that effects are the same in samples of *secondary* school students. Research indicates that perceived self-efficacy is not constant throughout adolescence but rises and falls with age (e.g. Schunk & Meece, 2006). Perceived self-efficacy also appears to be affected by different factors at different educational stages (e.g. Pajares et al., 2007). In addition, some research suggests that adults may benefit more from SF interventions than children and adolescents (Stams et al., 2006). The relative effects of SF/PF questions may therefore differ between school children and adult undergraduates. Researchers, therefore, need to examine the impact of written SF/PF questions in schools (as well as universities).

A second major limitation of the studies in the review is the fact that the dependent variables did not include commitment. This omission is especially surprising given the importance of commitment in goal pursuit (Klein et al. 2013). One of the primary determinants of goal commitment is in fact goal attainment expectancy. If written SF questions do indeed have positive effects on expectancy, then they may indirectly raise people’s commitment. This possibility - not examined in the reviewed studies – should be investigated,

A third limitation uncovered by the review relates to the experimental conditions. In extracting information from each study, the author listed all of the questions that were used in an intervention and then characterised the intervention as either (i) a 'single-category' intervention if only one type/category of SF question was used, or (ii) a 'battery' intervention if more than one type/category of SF question was used (see the note in Appendix D for clarification). All of the studies except Wehr (2010) may described as *battery* interventions in that collections of (different types of) SF questions were compared with collections of PF alternatives. This is illustrated in Appendix I, which displays the SF/PF questions originally compared by Grant (2012) and then used (or adapted) in all of the other studies except Wehr (2010). As will be observed, the SF condition begins with (what may be described as) a truncated version of the 'Miracle Question,' follows with (what may be described as) a version of 'small steps,' and then includes three other questions that (do not fall neatly into one of the recognised categories but) enquire into participants' thoughts about the 'solution' and reactions when having those thoughts. Thus, at least three different types/categories of questions may be identified in this battery: 'Miracle Question' + 'Small Steps' + Thoughts/reactions. The questions in the PF condition are even more diverse, covering the duration of the problem, the origins of the problem, the individual's feelings about the problem and more besides. It is impossible to evaluate any given type of question when multiple types of questions are included. More focused studies would therefore be useful in which specific (types of) questions are isolated and compared – a point acknowledged by Neipp et al. (2016). For example, a study might compare the solution-focused emphasis on resources ("what helps?") with the problem-focused emphasis on obstacles ("what hinders?"). Alternatively, a study might isolate the effects of "scaling" questions by excluding all other types of question.

Chapter 3: Contributions of the Author's Public Output

The systematic review (Chapter 2) uncovered three important limitations in the evidence base that existed before the author's publications: (i) the fact that participants were university students (only); (ii) the absence of commitment (or motivation) from the dependent variables; (iii) the combining of multiple types of question in the same experimental condition. The author addressed these limitations in his own experimental studies and made important contributions to our understanding of the effects of written SF/PF questions on students' expectancy and commitment. The progression from study to study is summarised in Appendix K. Four of the main *contributions* of the studies (taken together) are discussed below.

Contribution 1: Illuminating the Effects of SF Questions in *Secondary School* Students

Many popular books advocate the use of solution-focused approaches with secondary school students (e.g. Franklin et al., 2018; Murphy, 2015; Ratner & Yusuf, 2015). However, SF research with secondary school students has generally involved extended, multi-component interventions such as "Working on What Works" (e.g. Wallace et al., 2020). Such interventions typically include not only solution-focused questions but also goal-setting, feedback and face-to-face interactions with teachers, interventionists and sometimes other students. Assessing the impact of SF questions (alone) is not possible in such interventions. As indicated in Chapter 2, the research that *has* focused on (written) SF questions has involved university students. For example, Grant and Gerrard (2020) found that undergraduates responding to SF questions reported a greater improvement in perceived self-efficacy than students responding to PF questions and students responding to both SF and PF questions. Seeking to extend the research to *secondary* school students, Abdulla and Woods (2021b) found that students responding to SF questions (about resources) reported higher expectancy than students responding to PF questions (about obstacles) and students responding to both SF and PF questions. This finding mirrored that reported by Grant and Gerrard (2020). However, the finding reported by Abdulla and Woods (2021b) was directly relevant to schools rather than universities. Moreover, the results reported by Abdulla and Woods (2021b) have more ecological validity and are therefore more useful for schools than those reported by Grant and Gerrard (2020). Whereas Grant and Gerrard (2020) presented students with a battery of

questions not normally asked outside the laboratory, Abdulla and Woods (2021b) presented students with simple questions commonly asked in everyday secondary school contexts.

The author's other studies, however, suggest that the effects of (other) SF questions on secondary school students may not be as positive or as large as practitioners and the popular literature suggest. For example, Abdulla and Woods (2021d) found that success scaling questions (and commonly used follow-ups) did little to enhance secondary school students' expectancy and commitment. Similarly, Abdulla (2021) found that asking secondary school students to recall success did little to enhance perceived self-efficacy. Abdulla and Woods (2021c) found that questioning secondary school students about "what's going well" apparently had both positive and negative effects (as explained later on). In all of the author's studies, attrition or "drop-out" was close (or even equal) to zero. This suggests that secondary schools administering written SF questions may achieve high response rates from students. However, the author's public output also suggests that the *effects* of (many of) those questions on expectancy and commitment are likely to be small and mixed.

Contribution 2: Illuminating the Impact of SF Questions on *Commitment* (as well as Expectancy)

One of the primary aims of SF coaching is to enhance motivation or commitment (e.g. O'Connell et al., 2012). And yet in the research on SF questions prior to the author's publications "commitment" or "motivation" was not one of the dependent variables (see Appendix F). The studies reviewed in chapter 2 focused instead on expectancy-like variables (e.g. "self-efficacy") and other variables such as positive/negative affect. One of the most important contributions of the author's public output is therefore the focus on *commitment*. "Commitment" was a dependent variable in four of the author's studies (Abdulla & Woods, 2021a; 2021b; 2021c; 2021d).

Abdulla and Woods (2021a) found that the level of commitment in students presented with a small package of SF questions was statistically indistinguishable from the level of commitment reported by students who had engaged in mental contrasting with implementation intentions (MCII) – a popular goal-setting and planning technique[9]. On the face of it, this suggests that SF questions may be as effective as MCII in terms of (enhancing) goal commitment. However, it should be

noted that “autonomous planning” (a third condition in which students were allowed to formulate their own plans) was associated with a level of commitment statistically indistinguishable from both SF questions and MCII. Thus, the positive effects of SF questions on students’ goal commitment should not be overemphasised.

Abdulla and Woods (2021b) did find that (compared to PF questions about obstacles) SF questions about resources may have a positive indirect effect on commitment by enhancing expectancy. In other words, relative to the other conditions (e.g. PF questions about obstacles), SF questions raised expectancy, which in turn raised commitment[10]. As far as the author is aware, this was the first study to provide evidence that written SF questions may indirectly enhance commitment by raising expectancy. It should be noted, however, that the estimated indirect effects on commitment were small. Moreover, total and direct effects of condition on commitment were not statistically different from zero. Similarly, Abdulla and Woods (2021) found that success scaling questions (and typical follow-ups) apparently had little effect on commitment (direct *or* indirect).

Abdulla and Woods (2021c) in fact hypothesised that some SF questions may even have a *negative* direct effect on commitment (in addition to a positive indirect effect). SF advocates typically argue that asking individuals about “what’s going well” (rather than “what’s *not* going well”) has a positive effect on confidence and motivation/commitment (e.g. Blundo et al., 2014). However, Abdulla and Woods (2021c) hypothesised that (compared to “what’s not going well”) “what’s going well” may have both positive *and* negative effects. On the one hand, “what’s going well” may raise commitment by raising expectancy[11]. On the other hand, *when expectancy is held constant*, “what’s going well” may be associated with *lower* commitment (to improvement) than “what’s not going well,” given that students may rest on their laurels. In other words, “what’s going well” may lead to complacency whereas “what’s *not* going well” may stimulate a desire to improve. If so, then “what’s going well” may in fact have a negative direct effect on commitment (to improvement) relative to “what’s going well.” Results of the study conducted by Abdulla and Woods (2021c) supported this hypothesis: “what’s going well” was associated with both a positive indirect effect and negative direct effect on students’ goal commitment.

In summary, the author’s public output suggests that the effects of (particular) SF questions on students’ goal commitment may not be as large (or even as positive) as popular texts suggest. Some SF questions (e.g. questions about resources) may have a small positive effect on commitment via enhanced

expectancy. However, other types of SF question may have little or no positive effects or both positive and negative effects.

Contribution 3: Investigating the Effects of *Specific* (Types of) Questions

Chapter 2 made it clear that almost all previous research on SF/PF questions combined various types of question (see Appendix I). Such research cannot shed any light on the impact of specific (types) of questions/techniques (when used in isolation). One of the most important contributions of the author's public output was to illuminate the effects of particular SF/PF questions/techniques. Separate studies were conducted on questions about resources (vs. obstacles) (Abdulla & Woods, 2021b), "what's going well" vs. "what's *not* going well" (Abdulla & Woods, 2021c), questions focusing on "what else" students could do to attain their goals (Abdulla & Woods, 2022), questions about previous success (Abdulla, 2021), and scaling questions (Abdulla & Woods, 2021d).[12]It was noted under Contribution 2 that compared to PF questions about obstacles, SF questions about resources may have a positive effect on expectancy and commitment (Abdulla & Woods, 2021b). However, compared to a PF focus on "what's *not* going well," "what's going well" appears to have both positive and negative effects on commitment (Abdulla & Woods, 2021c). In addition, asking students to generate multiple (rather than few) means of goal attainment appears in some cases to have both positive and negative effects on expectancy (Abdulla & Woods, 2021d), a finding discussed in more detail under Contribution 4. In the remainder of this section, a little more is said about questions focusing on previous success and "success scaling" questions.

Abdulla (2021) investigated the effects of asking students to recall success on perceived self-efficacy in writing ideation[13]. Students in a "recollection of relevant success" condition reported higher perceived self-efficacy for writing ideation than students in the other two conditions. However, the "advantage" was extremely small (1-2 percentage points on 0-100% scale) and group differences were not statistically significant. In a second experiment, students in the "recollection of relevant success" condition again reported higher perceived self-efficacy than students in the control condition. However, the estimated "advantage" was again very small and not statistically significant. Abdulla's (2021) findings suggested that asking students to recall previous success (a common SF technique) may do little[14] to enhance their perceived self-efficacy.

Abdulla and Woods (2021d) focused specifically on “success scaling” questions[15].Scaling questions may be the most frequently asked questions in solution-focused work (e.g. Skidmore, 1983). Qualitative research suggests that teachers consider scaling to be highly effective (e.g. Doveston & Keenaghan, 2010). However, prior to the study conducted by Abdulla and Woods (2021d) experimental research had combined scaling questions with other SF techniques (e.g. Daki & Savage, 2010). This makes it impossible to assess their impact. As far as the author is aware, Abdulla and Woods (2021d) conducted the very first quantitative study focusing specifically on scaling questions. In the first experiment, students in a success scaling (only) condition reported higher improvement expectancy and commitment to improvement (on average) than students in the other two conditions (binary assessment of performance and success scaling plus a typical follow-up question). However, the “advantages” were very small (e.g. ¼ of a point on a 0-10 scale) and not statistically significant. In the second experiment, students in a “success scaling plus two follow-up questions” condition reported higher expectancy and commitment (on average) than students in the other two conditions. However, group mean differences were again very small and not statistically significant. Overall, therefore, Abdulla and Woods (2021d) did not find much evidence to support the use of success scaling questions as opposed to PF questions or a binary evaluation of performance. Other types of scaling questions need to be studied.

In summary, the effects of specific SF questions on students’ expectancy and commitment appear not to be as large or as clearly positive as the popular literature would lead one to suppose. *Combinations* of SF questions (e.g. questions about previous success + scaling questions + questions about resources + questions eliciting “small steps”) may have a clearer positive effect, especially when compared with *combinations* of PF alternatives, as is the case in the research conducted by Grant and colleagues (see Chapter 2). However, SF questions may also have inherent limitations. For example, as explained, the positive indirect effect of “what’s going well” on students’ goal commitment (via enhanced expectancy) may be offset by a *negative* direct effect (i.e. a sense of complacency contrasting with the dissatisfaction associated with “what’s *not* going well”). There are other possible reasons for smaller-than-expected positive effects of written SF questions. These include the difficulty that may be experienced in generating a response – the basis of the final major contribution considered here.

Contribution 4: Highlighting the Importance of Ease-of-Retrieval / Difficulty-in-Generation

SF questions put the onus (of recalling an example or generating a response) on the student or coachee. For example, students might be asked to recall the last occasion on which they were successful in school (Metcalf, 2008) or they might be asked "how else" they could achieve a goal (e.g. Proudlock, 2017). As one popular text puts it, the core of solution-focused approaches (in education) is "helping students *generate their own solutions"* (Kim et al., 2017, p. 22, italics added). However, the ease/difficulty that students experience in generation may affect their expectancy or perceived self-efficacy. A great deal of research has in fact highlighted the importance of "ease-of-retrieval" (Weingarten & Hutchinson, 2018). This research suggests that individuals are influenced not only by the *content* of their thoughts but also by the ease/difficulty with which it is retrieved or generated. For example, in a study involving undergraduates, students asked to generate *many* means of goal attainment – a relatively difficult task – reported lower expectancy than students asked to generate only a few (Sanna & Schwarz, 2004).

However, the study by Sanna and Schwarz (2004) illustrates a major failing in the "ease-of-retrieval" research conducted prior to the author's publications. Like other researchers in this domain, Sanna and Schwarz (2004) did not directly examine the association between expectancy and ease-of-retrieval/generation (by, for example, regressing the former on the latter). Instead, they simply assumed that the observed between-group differences in post-test expectancy must have been due to between-group differences in ease-of-retrieval/generation. Two of the author's studies addressed this limitation and illuminate the effects of ease-of-retrieval/difficulty-in-generation on students' perceived self-efficacy and expectancy.

In two experiments involving secondary school students, Abdulla (2021) examined whether asking students to recall success in a particular domain raises perceived self-efficacy in that domain. However, Abdulla (2021) also sought to determine whether secondary school students are influenced by ease-of-retrieval. It was hypothesised that the easier/more difficult it is for students to recall success the higher/lower their perceived self-efficacy. Results from both experiments supported that hypothesis. Moreover, ease/difficulty in recalling success was associated with higher/lower perceived self-efficacy (PSE) *even when baseline PSE was controlled*[16]. Numerous books on teaching and education suggest that students benefit from recalling success (e.g. Cash, 2016). Similarly, solution-focused

practitioners frequently ask individuals to identify and reflect on previous success (e.g. O'Connell et al., 2012). Abdulla's (2021) study suggests that the efficacy of this approach is likely to depend on the ease with which examples of success are recalled. Students struggling to recall past success may even come to have a *lower* sense of self-efficacy.

In three experiments with different year groups, Abdulla and Woods (2022) investigated the effects of attempting to generate multiple (vs few) means of goal attainment on goal attainment expectancy. Amongst students relatively low in baseline expectancy it was found that ease/difficulty in generating means was associated with higher/lower posttest expectancy. As far as the author is aware, Abdulla and Woods (2022) thereby provided the first experimental evidence that (certain) secondary school students are influenced by ease/difficulty-in-generation when generating means of goal attainment[17]. This has extremely important implications. Secondary school students are frequently asked to generate (multiple) means of goal attainment. For example, teachers routinely ask students to list "as many ways as possible" to attain a particular goal (e.g. Beghetto et al., 2015; Conkin, 2012; Lapp et al., 2011). Similarly, when coachees have provided an answer to a solution-focused question, SF coaches typically ask "what else?" (e.g. de Shazer & Dolan, 2021). O'Connell et al. (2012, p. 51) state that the search for multiple solutions "may feel like hard work to the coachee, but brings far greater success than accepting someone else's solutions." Although these authors acknowledge the "hard work" (associated with generating multiple solutions) they do not appear to realise that it may actually lower expectancy (at least in female students with low baseline expectancy)[18].

Overall Contributions and Limitations of the Author's Public Output

All of the author's publications focused on the immediate psychological effects of written SF questions (delivered in a single session). As noted in the introduction, SF questions/techniques - originally developed in face-to-face therapy - are used increasingly frequently in writing. For example, SF questions are presented in counselling intake forms (Richmond et al., 2014) and computerised self-help tools (e.g. Cepukiene & Pakrosnis, 2018). Schools have the potential to deliver written SF questions to their students via a single survey (e.g. Murphy, 2015). Moreover, coaching itself - traditionally delivered face-to-face - is now offered through email/writing (Ribbers & Waringa, 2015). Understanding the effects of written SF

questions is therefore extremely important.

Collectively, the author's studies suggest that certain written SF questions may have *some* positive effects on expectancy and commitment, but these effects are likely to be smaller than popular texts imply. For example, compared to PF questions about obstacles, SF questions about resources may have a moderately positive effect on expectancy and a small positive indirect effect on commitment (Abdulla & Woods, 2021b). However, success scaling questions (Abdulla & Woods, 2021d) and questions about previous success (Abdulla, 2021) may do little to enhance expectancy/perceived self-efficacy and commitment. Moreover, some SF questions may have both positive *and* negative effects on commitment, e.g. "what's going well" vs "what's not going well". These effects may ultimately cancel each other out, in which case little overall effect on commitment may be observed (Abdulla & Woods, 2021c).

The author's research also sheds light on the importance of ease-of-retrieval/difficulty-in-generation. SF questions put the onus on the coachee to generate a response. In fact, it has been said that the most frequently asked question in SF therapy is "what else?" (Ratner et al., 2012). "What else?" is also an extremely common question in SF coaching (Beumer-Peeters, 2021). In asking a question such as "what else?" SF practitioners attempt to elicit a large number of examples, ideas or "solutions." The author's research, however, suggests that the ease/difficulty experienced in generating a response sometimes has an impact on students' perceived self-efficacy/expectancy (Abdulla, 2021; Abdulla & Woods, 2022).

Of course, the author's research has its own limitations. All experiments were conducted with female students at an independent secondary school in London. Questions may therefore be asked about generalisability. For example, researchers (and practitioners) may wonder whether the findings are likely to apply to (a) *male* students and (b) students in *state* schools. Each of these extensions is now briefly considered.

It is sometimes suggested that males respond better than females to action-oriented solution-focused approaches (e.g. Liddon et al., 2019). Unpublished research conducted by the author suggests that gender may indeed moderate the effects of certain written SF/PF questions[19]. In one large study (currently under review) the author found that positive effects of the "Miracle Question" may be restricted to males. This study, however, involved adults rather than school children.

Research on school-age children should also be considered and may shed some light on the extent to which *boys* would engage with (and benefit from) the interventions considered here. School-age girls consistently have higher scores than boys on measures of conscientiousness (e.g. De Bollet et al., 2015). In addition, girls are often considered (by teachers and by themselves) to be more motivated in school and to be superior (to boys) in self-control and self-regulation (e.g. Duckworth et al., 2015). These characteristics (conscientiousness, motivation, self-control and self-regulation) may mean that girls are more likely than boys to engage with and complete the sorts of interventions examined here, especially, perhaps, when unsupervised. Indeed, one study comparing the survey responses of male and female undergraduates found evidence suggesting that women "participate more conscientiously than men when unsupervised" (Ramsey et al., 2016, p.357). If the same is true of children, then the extremely high completion rates achieved by the author with females may not be replicated with males, especially if (male) students are asked to complete the interventions at home. Moreover, if (as a result of lower conscientiousness, lower motivation or poorer self-regulation), boys do not invest as much effort as girls when taking part in the interventions, then effect sizes may also be reduced. Although not always consistent, research on positive psychology interventions suggests that the more effort and time that participants invest the more likely they are to benefit (see Wang et al., 2017 for a brief review). In addition, effect sizes tend to be smaller in self-administered surveys when participants pay inadequate attention (Peyton et al., 2021). Inadequate attention may be more likely if participants are boys lacking in conscientiousness/self-control.

The considerations in the above paragraph suggest that the (generally) small "effects" observed in the author's studies may be even smaller with boys. However, there are some reasons for thinking that the *opposite* may be true. For example, research suggests that mastery experience has a stronger (positive) effect on perceived self-efficacy in males than in females (Zander et al., 2020). Several types of questions examined by the author focus on mastery experience (e.g. asking students to recall success, success scaling questions, etc.). These questions may therefore be more effective with boys than girls. For example, asking students to recall success may have a stronger effect on perceived self-efficacy in male students. The author's *current* research includes both males and females, which makes it possible to examine this possibility.

The fact that participants attended an *independent* school also raises

questions about generalisability. On the one hand, the type of school that students attend may have very little effect on the author's findings. Students in state schools are very similar to students in private schools in many important respects. For example, a study comparing the characteristics of students in the two types of school found only a "negligible difference when it came to scores for Confidence (and for Emotional Control)" (AQR, 2017, p.3). It may therefore be assumed that baseline expectancy levels in state school students are similar to the levels observed in the author's studies. Moreover, many of the author's findings are likely to apply to students at *any* type of school. For example, five of the author's experiments across two studies suggest that students' perceived self-efficacy and expectancy are influenced by the ease/difficulty that they have in responding to SF questions (Abdulla, 2021; Abdulla & Woods, 2022). It is difficult to see why this would be true in independent schools only. The metacognitive experience (i.e. finding it easy/difficult to generate a response and then drawing conclusions from that ease/difficulty) presumably has little to do with the type of school that a student is in. Ease-of-retrieval "effects" have been reported with different types of students in different types of institution, including undergraduates in colleges/universities (e.g. Hermann et al., 2002) and "typically developing children aged 4, 6, and 8 years old" (Geurten et al., 2015, p.407). The author's findings regarding ease-of-retrieval and difficulty-in-generation are therefore unlikely to apply to independent schools only.

On the other hand, *some* of the SF questions examined by the author may have somewhat different effects in state schools. For example, asking students to identify their resources and to consider how they might use them - as the author did in one of his studies (Abdulla & Woods, 2021b) – may not have the same effects in a state school. Independent schools (and their students) have considerably more resources than state schools (e.g. Henderson et al., 2022). Inviting students in independent schools to reflect on their (many) resources may therefore have a larger effect on expectancy than asking students in (certain) state schools to reflect on their (relatively) few resources. Abdulla and Woods (2021b) found a moderately large effect (on expectancy) of asking students to consider their resources – 0.68 of a point on the 0-10 scale. Whether the same intervention would have a similar effect in a state school is not clear. If students in (some) state schools *struggle* to think of "resources" they may come to have lower expectancy (via "difficulty-in-generation"). Nevertheless, even if the positive effects of asking students about resources are confined to (or larger in) independent schools, it should be remembered that there

are over half a million students in independent schools in the UK (UK Government, 2022). Thus, the population about which generalisations could be made would still be in the hundreds of the thousands.

Before other limitations of the author's research are considered, one final point should be made about generalisability. In several important cases, the author's research is fully consistent with *previous* research, which suggests that the results are generally true. For example, a great deal of research has found that expectancy is positively related to commitment (Klein et al., 2013). The author conducted four studies in which both expectancy and commitment were measured (Abdulla & Woods, 2021a, 2021b, 2021c, 2021d). In all four studies expectancy was positively related to commitment. Critcher and Rosenzweig (2015) found that undergraduate students had higher improvement expectancy when recent performance was perceived as satisfactory. Abdulla and Woods (2021c) obtained the same result with secondary school students. Hermann et al. (2002) found that undergraduate students were more sensitive to retrieval difficulty when they were high in self-doubt. Abdulla and Woods (2022) found that *secondary school* students were more sensitive to retrieval difficulty when they were low in expectancy. Those who are high in self-doubt are likely to be low in expectancy (Carroll et al., 2009; Ghassemi et al, 2021). The findings of Abdulla and Woods (2022) are therefore entirely consistent with those of Hermann et al. (2002). In summary, it should not be assumed that results obtained with female secondary school students are unique to that population. On the contrary, many of the author's findings are likely to apply more generally.

Another limitation of the author's research concerns the timeframe. The author's studies focus on *immediate* psychological effects (i.e. effects arising within minutes after presentation of the questions). It is possible that the effects of SF questions are more noticeable (or enhanced) when they are used repeatedly in extended or multi-session interventions[20]. In some cases, longer SF interventions involving human interaction have been associated with large effects (e.g. Daki & Savage, 2010)[21]. SF questions may also have *delayed* effects. For example, students presented with an SF question about resources at Time 1 may not be able to list many resources at Time 2 (a few seconds after reading the question) but may think of resources at Time 3 (e.g. half an hour later), at which point their expectancy may be enhanced. Future studies could therefore include a second (delayed) posttest. Finally, the author's research has focused predominantly on expectancy

and commitment. The effects of written SF questions on other important variables (e.g. goal clarity and affect) also deserve to be examined[22].

Conclusion

The author's studies suggest that written SF/PF questions can be easily delivered to large groups of secondary school students. Completion rates may be very high, at least in the context of an independent school of *female* students. Nevertheless, the immediate effects of written SF questions (when used in isolation) appear to be more modest than the popular literature would lead one to suppose, at least with regard to expectancy and commitment in female secondary school students.

It may be useful to consider how the author's findings could be disseminated and applied in schools. Educators (and their students) are often advised to "focus on the positives" (e.g. Breaux & Whitaker, 2014; Richman et al., 2013; Williams et al., 2016). Students (and teachers) are therefore commonly encouraged to pay attention to "what's going well" (e.g. Berger et al., 2021). A school culture of "positivity" may benefit students in several ways but educators should also be aware of the possible drawbacks. On the one hand, "what's going well" may indeed have a positive effect on commitment (via enhanced expectancy). On the other hand, it may also be associated with *lower* commitment-to-improvement as a result of the ensuing complacency Teachers could be asked to reflect on the following question(s): When will students be (more) motivated to improve? When they have (already) achieved a satisfactory outcome? Or when they are *dissatisfied* with their current performance? Such questions may serve to remind teachers (who prefer to "focus on the positives") that negatives too can be motivating. The author has been asked to train teachers at various schools in coaching and related skills. When delivering this training, the author often includes questions such as the above, which allow teachers to weigh up the merits and demerits of focusing on (a) satisfactory and (b) *un*satisfactory performance. Most teachers agree that some mix of the two should be considered.

Those working with students may also benefit from learning about the effects of ease-of-retrieval and difficulty-in-generation. Teachers, counsellors, coaches and school psychologists regularly ask students to list "as many ways as possible" to achieve goals (e.g. Beghetto et al., 2015; Conkin, 2012; Mazza et al., 2016). In addition, educational professionals are often told that confidence is enhanced by

recalling prior success (e.g. Cash, 2016; Cross, 2011; Matthews, 2012). These professionals should be informed that the ease/difficulty that students experience in generating means of goal attainment or in recalling prior success is likely to affect their expectancy/perceived self-efficacy (especially, it seems, if students are low in expectancy to begin with). Once they are aware of the likely effects of ease-of-retrieval/difficulty-in-generation, educational professionals may respond in a number of ways. First, teachers can help students by pointing out that ease-of-retrieval/difficulty-in-generation does *not* imply that students themselves lack ability. Research indicates that if individuals can be led to attribute difficulty-in-retrieval to some aspect of the situation (rather than some aspect of themselves), then it may *not* have a negative effect on their judgements (Ruder & Bless, 2003). In addition, professionals working with students may wish to consider how they can *facilitate* recollections of success and generation of "solutions." They could, for example, encourage students to keep "success journals" (Pajares, 2008) and/or invite them to make a list of "solutions" that prove useful for goal attainment. Students wanting to remind themselves of past success or identify means of goal attainment could then simply consult their journals and lists.

Finally, those inclined to use SF questions/techniques should be aware that they are not "magic bullets." Asking students to recall success, or to reflect on "what's going well," or to consider their performance on 0-to-10 scale *may* bear some fruit in the long run. But if these techniques are used in isolation, any immediate positive effects on expectancy/commitment are likely to be small (or perhaps moderate) rather than large.

The author is disseminating his findings in several ways. First, he shares his key findings whenever he is asked to deliver training in schools. Second, the author's open access publications are available for download on Researchgate and have already been read hundreds of times. Third, the author has been invited to present at educational conferences. The author however recognises that much more research needs to be conducted on SF questions before any major policy recommendations can be made.

References

Abdulla, A. (2017). *Coaching students in secondary schools: Closing the gap between performance and potential.* Routledge

Abdulla, A. (2021). Asking students to recall success may not enhance their perceived self-efficacy. *Learning and Individual Differences, 101984.*

Abdulla, A., & Woods, R. (2021a). Comparing mental contrasting with implementation intentions against solution-focused and autonomous planning. *School Psychology International, 42*, 398-421.

Abdulla, A., & Woods, R. (2021b). Obstacles vs. Resources - Comparing the Effects of a Problem-Focused, Solution-Focused and Combined Approach on Perceived Goal Attainability and Commitment. *International Journal of Applied Positive Psychology,* 6, 175–
194.

Abdulla, A., & Woods, R. (2021c). The effects of current unsatisfactory performance and evaluative approach on improvement expectancy and commitment to improvement. *Motivation and Emotion.* Advance online publication. https://doi.org/10.1007/s11031-021-09864-
8

Abdulla, A., & Woods, R. (2021d). The Effect of Solution-Focused Scaling and Solution-Focused Questions on Expectancy and Commitment. *School Psychology Review.* Advance Online Publication DOI: 10.1080/2372966X.2021.1942196

Abdulla, A., & Woods, R. (2022). “How Else Could You Do that?” The effects of generating multiple means of goal attainment on female students’ perceived goal attainability. *Contemporary Educational Psychology, 70*.

Adams, M. (2015). *Coaching Psychology in Schools: Enhancing Performance, Development and Wellbeing*. Routledge.

Altintas, E., Karaca, Y., Moustafa, A., & El Haj, M. (2020). Effect of best possible self intervention on situational motivation and commitment in academic context. *Learning and Motivation, 69,* Article 101599.

AQR. (2017). *Understanding "soft skills" development at Independent Schools: An analysis of mental toughness at UK independent schools*. AQR International. January 2017. Retrieved from https://www.isc.co.uk/media/3856/isc_soft_skills_mental_toughness_report.pdf

Asai, K (2017, November 4-5). *Comparing Solution focused and Problem focused questions among Japanese people* [Poster presentation]. The 8th Pacific Rim Conference on Education, Sapporo, Japan.

Atkinson, C., & Amesu, M. (2007). Using solution-focused approaches in motivational interviewing with young people. *Pastoral Care in Education, 25*, 31–37. https://doi.org/ 10.1111/j.1468-0122.2007.00405.x

Bandura, A. (1997). *Self-efficacy: The exercise of control.* W H Freeman/Times Books/ Henry Holt & Co

Beghetto, R., Kaufman, J., & Baer, J. (2015). *Teaching for creativity in the common core classroom.* Teachers College Press

Berg, I. K., & de Shazer, S. (1993). Making numbers talk: Language in therapy. In S. Friedman (Ed.), *The new language of change: Constructive collaboration in psychotherapy* (pp. 5–24). Guilford Press.

Berg, I. K., & Szabó, P. (2005). *Brief coaching for lasting solutions.* W W Norton & Company.

Berger, R., Vilen, A., & Woodfin, L. (2021). *We Are Crew: A Teamwork Approach to School Culture.* EL Education.

Berzin, S., O'Brien, K., & Tohn, S. (2012). Working on What Works: A New Model for Collaboration. *School Social Work Journal*, *36*, 15–26

Beumer-Peeters, C. (2021). *Solution Focused Coaching for Adolescents: Overcoming Emotional and Behavioral Problems*. Routledge

Blundo, R.G., Bolton, K.W., & Hall, J.C. (2014). Hope: Research and theory in relation to Solution-Focused practice and training. *International Journal of Solution-Focused Practices, 2*, 52-62.

Bond, C., Woods, K., Humphrey, N., Symes, W., & Green, L. (2013). Practitioner review: The effectiveness of solution-focused brief therapy with children and families: A systematic and critical evaluation of the literature from 1990-2010. *Journal of Child Psychology & Psychiatry, 54,* 707-23

Breaux, A. & Whitaker, T. (2014). *Making good teaching great: Everyday strategies for teaching with impact.* Routledge

Card, N. A. (2012). *Applied meta-analysis for social science research.* Guilford Press

Carlson, K. D., & Schmidt, F. L. (1999). Impact of experimental design on effect size: Findings from the research literature on training. *Journal of Applied Psychology, 84*, 851-862.

Carroll, P. J., Shepperd, J. A., & Arkin, R. M. (2009). Downward self-revision: Erasing possible selves. *Social Cognition, 27*(4), 550–578

Cash, R. M. (2016). *Self-regulation in the classroom: Helping students learn how to learn*. Free Spirit Publishing

Cepukiene, V., & Pakrosnis, R. (2018). Introducing unguided computerized solution-focused self-help into university counseling services. *International Journal of Psychology: Biopsychosocial Approach*, 9-29

Cohen J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. Routledge Academic

Conklin, W. (2012). *Strategies for Developing Higher-Order Thinking Skills*. Shell Educational Publishing.

Critcher, C. R., & Rosenzweig, E. L. (2014). The performance heuristic: A misguided reliance on past success when predicting prospects for improvement. *Journal of Experimental Psychology: General, 143*, 480–485

Cross, M. (2011). *Children with social, emotional and behavioural difficulties and communication problems*. Jessica Kingsley

Cumming, G. (2012). *The new statistics: Effect sizes, confidence intervals, and meta- analysis*. Routledge

Daki, J., & Savage, R. S. (2010). Solution-focused brief therapy: Impacts on academic and emotional difficulties. *The Journal of Educational Research, 103(5)*, 309–326

Davis, T. E., & Osborn, C. J. (2000). *The solution-focused school counselor: Shaping professional practice.* Taylor & Francis.

De Bolle, M., De Fruyt, F., McCrae, R. R., Löckenhoff, C. E., Costa, P. T., Jr., Aguilar-Vafaie, M. E., Ahn, C.-k., Ahn, H.-n., Alcalay, L., Allik, J., Avdeyeva, T. V., Bratko, D., Brunner-Sciarra, M., Cain, T. R., Chan, W., Chittcharat, N., Crawford, J. T., Fehr, R., Ficková, E., . . . Terracciano, A. (2015). The emergence of sex differences in personality traits in early adolescence: A cross-sectional, cross-cultural study. *Journal of Personality and Social Psychology, 108*(1), 171–185.

De Jong, P., & Berg, I. K. (2012). *Interviewing for solutions*. Cengage Learning

de Shazer, S. (1988). *Clues: Investigating solutions in brief therapy.* W W Norton & Co.

Doveston, M., & Keenaghan, M. (2010). Teachers and educational psychologists working together: What can we learn? *Support for Learning, 25,* 131–137.

Duckworth A. L., Grant H., Loew B., Oettingen G., Gollwitzer P. M. (2011). Self-regulation strategies improve self-discipline in adolescents: Benefits of mental contrasting and implementation intentions. *Educational Psychology*, 31, 17–26

Duckworth, A. L., Shulman, E. P., Mastronarde, A. J., Patrick, S. D., Zhang, J., & Druckman, J. (2015). Will not want: Self-control rather than motivation explains the female advantage in report card grades. *Learning and Individual Differences, 39,* 13–23

Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist, 34*, 169–189.

Feldman, D. B., Rand, K. L., & Kahle-Wrobleski, K. (2009). Hope and goal attainment: Testing a basic prediction of hope theory. *Journal of Social and Clinical Psychology, 28*, 479-497

Franklin C., Guz S., Zhang, A., Kim, J. S., Zheng, H., Hai, A. H., Cho, Y., & Shen, L. (2020). Solution-focused brief therapy for students in schools: A comparative meta-analysis of the English and Chinese literature. *Journal of the Society for Social Work and Research*. https://doi.org/10.1086/712169

Franklin, C., Harris, M. B., & Allen-Meares, P. (Eds.). (2008). *The school practitioner's concise companion to preventing dropout and attendance problems.* Oxford University Press.

Franklin, C., Kim, J., & Stewart, K. S. (2012). Solution-focused brief therapy in school settings. In C. Franklin, T. Trepper, W. Gingerich, & E. McCollum (Eds.), *Solution-focused brief therapy: A handbook of evidence-based practice* (pp. 231–246). Oxford University Press

Franklin, C., Streeter, C. L., Webb, L., & Guz, S. (2018). *Solution focused brief therapy in alternative schools*. Routledge

Fruwert, R.M. (2013). *Effects of coaching question*s. [Internship Report]. University of Amsterdam.

Ghassemi, M., Wolf, B. M., Bettschart, M., Kreibich, A., Herrmann, M., & Brandstätter, V. (2021). The dynamics of doubt: Short-term fluctuations and predictors of doubts in personal goal pursuit. *Motivation Science, 7*, 153–164.

Ghul, R. (2009). Learning with enthusiasm. In E. Connie & L. Metcalf (eds), *The Art of. Solution-Focused Therapy* (pp. 155-174).

Gingerich, W. J., & Peterson, L. T. (2013). Effectiveness of solution-focused brief therapy: A systematic qualitative review of controlled outcome studies. *Research on Social Work Practice, 23*, 266–283

Grandison, P. (2007). A combined approach: Using eye movement desensitisation and reprocessing (EMDR) within a framework of Solution Focused Brief Therapy. *Educational & Child Psychology, 24*, 56–64.

Grant , A.M. (2006). Solution focused Coaching . In J. Passmore (Ed.) *Excellence in Coaching: The Industry Guide* , pp. 73 – 90 . KoganPage : London.

Grant, A. M., & O'Connor, S. A. (2010). The differential effects of solution-focused and problem-focused coaching questions: A pilot study with implications for practice. *Industrial and Commercial Training, 42*, 102–111.

Grant, A. M., & O'Connor, S. A. (2018). Broadening and building solution-focused coaching: Feeling good is not enough. *Coaching: An International Journal of Theory, Research and Practice, 11*, 165–185.

Grant, A. M., & Gerrard, B. (2019). Comparing problem-focused, solution-focused and combined problem-focused/solution-focused coaching approach: Solution-focused coaching questions mitigate the negative impact of dysfunctional attitudes. *Coaching: An International Journal of Theory, Research and Practice, 1–17*

Green, S., Grant, A., & Rynsaardt, J. (2007). Evidence-based life coaching for senior high school students: Building hardiness and hope. *International Coaching Psychology Review, 2*, 24–32.

Greene, J., & Grant, A.M. (2003). *Solution-focused coaching: Managing people in a complex world.* Momentum Press.

Gribbin, G. (2017). *Keeping up with young people and a changing counselling environment: Exploring the use of between session text messages to support face-to-face counselling*. [Master's Thesis]. University of Canterbury

Guyatt, G. H., Oxman, A. D., Vist, G. E., Kunz, R., Falck-Ytter, Y., Alonso-Coello, P., & Schünemann, H. J. (2008). GRADE: An emerging consensus on rating quality of evidence and strength of recommendations. *BMJ, 336*(7650), 924–926

Hanton, P. (2011). *Skills in Solution-focused Brief Counselling and Psychotherapy.* Sage

Harrer, M., Cuijpers, P., Furukawa, T.A., & Ebert, D.D. (2021). *Doing Meta-Analysis with R: A Hands-On Guide*. Chapmann & Hall/CRC Press

Henderson, M., Anders, J., Green, F., & Henseke, G. (2022): Does attending an English private school benefit mental health and life satisfaction? From adolescence to adulthood. *Cambridge Journal of Education*, DOI: 10.1080/0305764X.2022.2040951

Hepworth, D. H., Rooney, R. H., Rooney, G. D., StromGottfried, K., & Larsen, J. (2017). *Direct social work practice: Theory and skills* (10th ed.). Cengage

Hermann, A. D., Leonardelli, G. J., & Arkin, R. M. (2002). Self-doubt and self-esteem: A threat from within. *Personality and Social Psychology Bulletin, 28*, 395–408

Higgins, J. P. T., Thomas, J., Chandler, J., Cumpston, M., Li, T., Page, M. J., Welch, V.A. (eds). (2022). *Cochrane Handbook for Systematic Reviews of Interventions Version 6.3 (Updated February 2022).* West Sussex: Wiley & Sons, Inc

Huang, S.-c., Jin, L., & Zhang, Y. (2017). Step by step: Sub-goals as a source of motivation. *Organizational Behavior and Human Decision Processes, 141,* 1–15

Isherwood, K., & Regan, S. (2005). Solutions not problems: Improving outcomes in an integrated mental health rehabilitation service using a Solution-Focused Brief Therapy approach. *Social Work and Social Sciences Review, 12*, 53–71.

Iveson, C. (2018). Solution-focused brief therapy. *Advances in Psychiatric Treatment, 8,* 149-157.

Jackson, P.Z. & McKergow, M. (2011). *The Solutions Focus: Making Coaching and Change Simple*. Nicholas Brealey International.

Johnson, R., & Conyers, L. (2001). Surviving the doctoral dissertation: A solution-focused approach. *Journal of College Counseling*, *4*, 77–80.

Kayrouz, R., & Hansen, S. (2019). I don't believe in miracles: Using the ecological validity model to adapt the miracle question to match the client's cultural preferences and characteristics. *Professional Psychology: Research and Practice, 51,* 223-236.

Kim, J. S., Kelly, M. S., & Franklin, C. (2017). SFBT Techniques and Solution Building. In J.S. Kim, M.S Kelly & C. Franklin (Eds.), *Solution-Focused Brief Therapy in Schools* (2nd ed.,pp.12-30). Oxford University Press.

Klein, H. J., Wesson, M. J., Hollenbeck, J. R., & Alge, B. J. (1999). Goal commitment and the goal-setting process: Conceptual clarification and empirical synthesis. *Journal of Applied Psychology, 84*, 885–896.

Klein, H. J., Cooper, J. T., & Monahan, C. A. (2013). Goal commitment. In E. A. Locke & G. P. Latham (Eds.), *New developments in goal setting and task performance* (pp. 65–89). New York: Routledge.

Kramer, J., Conijn, B., Oijevaar, P., & Riper, H. (2014). Effectiveness of a web-based solution-focused brief chat treatment for depressed adolescents and young adults: randomized controlled trial. *Journal of Medical Internet Research, 16*(5), e141.

Kruglanski, A. W., Pierro, A., & Sheveland, A. (2011). How many roads lead to Rome? Equifinality set-size and commitment to goals and means. *European Journal of Social Psychology, 41*, 344–352

Lapp, D., Flood, J. & Farnan, N. (2011). *Content area reading and learning*. Lawrence Erlbaum

Liddon, L., Kingerlee, R., Seager, M. & Barry, J.A. (2019). What are the factors that make a male-friendly therapy? in J.A. Barry, M.J. Seager & L. Sullivan (Eds.), *The Palgrave Handbook of Male Psychology and Mental Health* (pp.671-694). Palgrave Macmillan.

Littell, J. H., Corcoran, J., & Pillai, V. (2008). *Systematic Reviews and Meta-analysis.* Oxford University Press

Locke, E. A., Latham, G. P., & Erez, M. (1988). The determinants of goal commitment. *Academy of Management Review 13*, 23–39

Locke, E. A., & Latham, G. P. (Eds.). (2013). *New developments in goal setting and task performance*. Routledge:Taylor & Francis Group

Lutz, A. B. (2014). *Learning solution-focused therapy: An illustrated guide*. American Psychiatric Publishing, Inc.

Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist, 41*, 954–969.

Massey, E. K., Gebhardt, W. A., & Garnefski, N. (2009). Self-generated goals and goal process appraisals: Relationships with sociodemographic factors and well-being. *Journal of Adolescence, 32,* 501-518.

Matthews, M. (2012). *Top tips for raising today's teens*. AuthorHouse.

Mazza, J. J., Dexter-Mazza, E. T., Miller, A. L., Rathus, J. H., & Murphy, H. E. (2016). *DBT Skills in Schools: Training for Emotional Problem Solving for Adolescents (DBT STESPS-A)*. Guilford Press.

Meier, D. (2005). *Team coaching* with the SolutionCircle. Cheltenham, UK: Solutions Books.

Metcalf, L. (2003). *Teaching toward solutions: A solution focused guide to improving student behaviour, grades, parental support and staff morale*. Crown House.

Metacalf, L. (2008). *Counseling toward solutions: A practical solution-focused program for working with students, teachers, and parents.* San Francisco: Jossey-Bass

Milner, J., & Bateman, J. (2011). *Working with children and teenagers using solution focused approaches: Enabling children to overcome challenges and achieve their potential*. Jessica Kingsley Publishers.

Morris, S. B. (2007). Estimating Effect Sizes From Pretest-Posttest-Control Group Designs. *Organizational Research Methods, 11,* 364–386

Murphy, J. J. (2015). *Solution-focused counseling in schools* (3rd ed.). American Counseling Association

Neipp, M.-C., Beyebach, M., Nuñez, R. M. & Martínez-González, M.-C. (2016a). The effect of solution-focused versus problemfocused questions: A replication. *Journal of Marital and Family Therapy, 42*, 525-535

Neipp, M.-C., Nuñez, R. M., Martínez-González, M.-C., & Beyebach, M. (2016b). *Questions as intervention: differences between solution-focused and problem-focused questions* [Poster Presentation]. The European Health Psychologist.

Niu, S. J., & Niemi, H. (2020). Teachers support of students' social-emotional and self-management skills using a solution-focused skillful-class method. *The European Journal of Social & Behavioural Sciences*, *27*(1), 3095–3113. https://doi.org/10.15405/ejsbs.269

Norman, C. C., & Aron, A. (2003). Aspects of possible self that predict motivation to achieve or avoid it. *Journal of Experimental Social Psychology, 39*, 500–507
O'Connell, B. (2001). *Solution focused stress counselling*. Continuum.

O'Connell, B., Palmer, S., & Williams, H. (2012). *Solution focused coaching in practice.* Routledge/Taylor & Francis Group.

Oettingen, G., & Gollwitzer, P. M. (2010). Strategies of setting and implementing goals: Mental contrasting and implementation intentions. In J. E. Maddux & J. P. Tangney (Eds.), *Social psychological foundations of clinical psychology* (pp. 114–135). The Guilford Press.

Pakrosnis, R., & Cepukiene, V. (2015). Solution-focused self-help for improving university students' well-being. *Innovations in Education and Teaching International 52*, 437-447.

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *Journal of Clinical Epidemiology*, *134*, 178-189.

Pajares, F., Johnson, M. J., & Usher, E. L. (2007). Sources of writing self-efficacy beliefs of elementary, middle, and high school students. *Research in the Teaching of English, 42*, 104–120.

Pajares, F. (2008). Motivational role of self-efficacy beliefs in self-regulated learning. In D. H. Schunk & B. J. Zimmerman (Eds.), *Motivation and self-regulated learning: Theory, research, and applications* (pp. 111–139). Lawrence Erlbaum Associates Publishers.

Peters, M. L., Flink, I. K., Boersma, K., & Linton, S. J. (2010). Manipulating optimism: Can imagining a best possible self be used to increase positive future expectancies? *The Journal of Positive Psychology, 5*, 204–211.

Petticrew, M., & Roberts, H. (2006). Systematic reviews in the social sciences: A practical guide. Blackwell Publishing.

Peyton K, Huber, G.A, & Coppock, A. (2021). The Generalizability of Online Experiments Conducted During the COVID-19 Pandemic. *Journal of Experimental Political Science*. https://doi.org/ 10.1017/XPS.2021.17

Proudlock, S. (2017). *The solution-focused way: Incorporating solution-focused therapy tools and techniques into your everyday work*. Routledge

Ramsey, S. R., Thompson, K. L., McKenzie, M., & Rosenbaum, A. (2016). Psychological research in the internet age: The quality of web-based data. *Computers in Human Behavior, 58,* 354–360.

Ratner, H., George, E., & Iveson, C. (2012). *Solution focused brief therapy: 100 key points and techniques.* Routledge.

Ratner, H., & Yusuf, D. (2015). *Brief coaching with children and young people*. Routledge

Reiter, M. D. (2010). Hope and Expectancy in Solution-Focused Brief Therapy. *Journal of Family Psychotherapy, 21*, 132-148.

Ribbers, A., & Waringa, A. (2015). *E-coaching: Theory and practice for a new online approach to coaching.* Routledge/Taylor & Francis Group.

Richman, S. D., Permuth, S., & Richman, P. M. (**2013). Successful teaching**: Practical ideas and enabling questions. R&L Education

Richmond, C.J. (2007). *A study of intake and assessment in solution-focused brief therap*y [Unpublished doctoral dissertation]. Western Michigan University.

Richmond, C. J., Jordan, S. S., Bischof, G. H., & Sauer, E. M. (2014). Effects of solution-focused versus problem-focused intake questions on pre-treatment change. *Journal of Systemic Therapies, 33, 33–47.*

Rohrig, P., & Clarke, J. (Eds.). (2008). *57 SF Activities for Facilitators and Consultants: Putting Solutions Focus Into Action*. Solutions Books.

Rost, L., Samuels, F., Leon-Himmelstine, C., & Marcus, R. (2020). *Digital Approaches to Adolescent Mental Health (Working paper)*. Basel: Fondation Botnar.

Ruder, M., & Bless, H. (2003). Mood and the reliance on the ease of retrieval heuristic. *Journal of Personality and Social Psychology, 85*(1), 20–32

Sanderfur, C. (2014). *Solution Focused Life Coaching, Simplified.* Author House.

Sanna, L. J., & Schwarz, N. (2004). Integrating Temporal Biases: The Interplay of Focal Thoughts and Accessibility Experiences. *Psychological Science, 15*, 474–48.

Schunk, D. H., & Meece, J. L. (2006). Self-efficacy development in adolescence. In *Self-efficacy beliefs of adolescents* (eds. F. Pajares & T. Urdan) (pp. 71–96). Information Age Publishing.

Seko, Y., & Lau, P. (2021). Solution-focused approach in higher education: a scoping review. Higher Education Research & Development. Advanced online publication. https://doi.org/10.1080/07294360.2021.1920893

Simm, J., & Ingram, R. (2008). Collaborative action research to develop the use of solution-focused approaches. *Educational Psychology in Practice*, *24*(1), 43–53. https://doi.org/10.1080/02667360701841247

Simmonds, S. (2019). A critical review of teachers using solution-focused approaches supported by educational psychologists. *Educational Psychology Research and Practice*, *5*, 1–8.

Simpson, A. (2018). Princesses are bigger than Elephants: effect size as a category error in evidence based education. *British Educational Research Journal 44*, 897-913.

Skidmore, J. E. (1993). *A follow-up of therapists trained in the use of the solution-focused brief therapy model*. Doctoral dissertation, University of South Dakota.

Sparrer, I. (2007). *Miracle, Solution and System: Solution-focused systemic structural constellations for therapy and organisational change.* Solution Books.

Stams, G. J. J. M, Dekovic, M., Buist, K., & De Vries, L. (2006). Effectiviteit van oplossingsgerichte korte therapie: een meta-analyse [Efficacy of solution focused brief therapy: A meta-analysis].*Tijdschrift voor gedragstherapie*, *39*, 81–94.

Steenbarger, B. N. (2018). Solution-Focused brief therapy: Building strengths, achieving goals. In M.J. Dewan., B.N. Steenbarger., & R.P. Greenberg (Eds.), *The Art and Science of Brief Psychotherapies* (3rd ed., pp. 199–218). American Psychiatric Association.

Sterne, J. A. C., Savović, J., Page, M. J., Elbers, R. G., Blencowe, N. S., Boutron, I., Cates, C. J., Cheng, H-Y., Corbett, M. S., Eldridge, S. M., Emberson, J. R., Hernán, M. A., Hopewell, S., Hróbjartsson, A., Junqueira, D. R., Jüni, P., Kirkham, J. J., Lasserson, T., Li, T., ... Higgins, J. P. T. (2019). RoB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ*, *366*, [l4898]

Stobie, I., Boyle, J., & Woolfson, L. (2005). Solution-focused approaches in the practice of UK educational psychologists: A study of the nature of their application and evidence of their effectiveness. *School Psychology International, 26*, 5–28.

Sundman, P., Schwab, M., Wolf, F., Wheeler, J., Cabie, M.-C., van der Hoorn, S., Pakrosnis, R., Dierolf, K., & Hjerth, M. (2020). *Theory of solution-focused practice*: Version 2020. BoD–Books on Demand.

Terni, P. (2014). Finding what works; but doing it requires self-control: An evaluation of a solution-focused online intervention to increase goal striving [Master's thesis, University of Pennsylvania]. https://repository.upenn.edu/mapp_capstone/54/

Theeboom, T., Beersma, B., & Van Vianen, A. E. M. (2016). The differential effects of solution-focused and problem-focused coaching questions on the affect, attentional control and cognitive flexibility of undergraduate students experiencing study-related stress. *The Journal of Positive Psychology, 11*, 460–469.

Thomas, F. N. (2013). *Solution-focused supervision: A resource-oriented approach to developing clinical expertise*. Springer Science+Business Media.

UK Government, (2022). *Schools, pupils and their characteristics* https://explore-education-statistics.service.gov.uk/find-statistics/school-pupils-and-their-characteristics

Valshtein, T. J., Oettingen, G., & Gollwitzer, P. M. (2020). Using mental contrasting with implementation intentions to reduce bedtime procrastination: Two randomised trials. *Psychology & Health, 35*, 275–301.

Wallace, L. B., Hang Hai, A., & Franklin, C. (2020). An evaluation of working on what works (WOWW): A Solution-Focused Intervention for Schools. *Journal of Marital and Family Therapy*, *46*, 687–700.

Walsh, K., Doherty, K., Andersen, L., Bingham, S., Crookes, P., Ford, K., & McSherry, R. (2018). “Just imagine that … ”: A solution focused approach to doctoral research supervision in health and social care. *International Journal of Teaching and Learning in Higher Education*, *30*, 161–171.

Wang, R. A. H., Nelson-Coffey, S. K., Layous, K., Bao, K. J., Davis, O. S. P., & Haworth, C. M. A. (2017). Moderators of wellbeing interventions: Why do some people respond more positively than others? *PLoS ONE, 12*(11), Article e0187601.

Wehr, T. (2010). The phenomenology of exception times: Qualitative differences between problem-focussed and solution-focussed interventions. *Applied Cognitive Psychology, 24*, 467–480.

Weingarten, E., & Hutchinson, J. W. (2018). Does ease mediate the ease-of-retrieval effect? A meta-analysis. *Psychological Bulletin, 144*(3), 227–283.

Williams, M., Mercer, S., & Ryan, S. (2016). *Exploring psychology in language learning and teaching*. Oxford University Press

Wilson, C. (2020). *Performance Coaching* (3rd ed.). Kogan Page.

Winbolt, B. (2011). *Solution focused therapy for the helping professions*. London: Jessica Kingsley Publishers.

Woods, K., Bond, C., Humphrey, N., Symes, W., & Green, L. (2011). *Systematic review of Solution Focused Brief Therapy (SFBT) with children and families*. *Department for Education (DfE) Research Report* RR170.

Zander, L., Höhne, E., Harms, S., Pfost, M., & Hornsey, M. J. (2020). When grades are high but self-efficacy is low: Unpacking the confidence gap between girls and boys in mathematics. *Frontiers in Psychology*, 11.

Endnotes

[1]Throughout this thesis “the author” is used to refer to the PhD student – Adam Abdulla.

[2]There are many terms in the popular and academic literature that are more or less synonymous with (goal attainment) expectancy. These include (goal-specific) “hope” (Feldman et al., 2009), “perceived goal attainability” (e.g. Huang et al., 2017), (goal-related) “confidence” (Ghul, 2009) and “perceived likelihood of goal attainment” (Kruglanski et al., 2011). Some researchers also use (perceived) “self-efficacy” in such a way that it is synonymous with (goal attainment) expectancy (e.g. Grant, 2012). In almost all cases, authors have in mind the degree to which individuals believe that they will attain particular goals, i.e. goal attainment expectancy. Throughout this thesis, “expectancy” is used as a shorthand for “goal attainment expectancy.”

[3]Many authors use the term “motivation” instead of “commitment.” Klein et al. (2013) distinguish between “motivation” and “commitment” but many others treat the terms as synonymous. For example, in their measure of “commitment” (to reduce bedtime procrastination), Valshtein et al. (2020) include the following two items: “How *committed* are you to get to bed on time?” and “How *motivated* are you to reduce or stop your bedtime procrastination?” (italics added). In this case there is little difference between being *committed* to attaining a goal and being *motivated* to attain the goal. The term “commitment” will be used throughout this thesis, but it should always be remembered that some authors use the term “motivation.” It should also be remembered that throughout this thesis “commitment” will always mean “*goal* commitment,” i.e. the extent to which individuals are committed to (attaining) particular goals.

[4]The researchers used different terms to refer to the “expectancy” variable in their studies. The terms used included “self-efficacy,” “confidence” and “goal approach” (see Appendix H). The measures for these variables were extremely similar and in several cases identical (in spite of the difference in terminology). Grant (2012, p.24) presents the three items used to measure “self-efficacy”: “Right now I feel very confident that I know how to solve this problem,” “I feel very confident I can deal with

this problem," and "I am confident that I can find a solution to this problem right now." Students who are (very) confident that they can solve a particular problem are likely to *expect* that they will solve the problem. Students who are *not* (very) confident that they can solve a particular problem are likely to have lower expectations of solving the problem. Thus, "self-efficacy" as conceptualised in the included studies seems to be akin to expectancy. Grant (2012, p.25) reports that the following item was used to measure "Goal Approach": "[P]lease rate how close you feel right now to your goal of actually solving this problem." It can be argued that this "goal approach" variable (like the researchers' "self-efficacy) is also akin to expectancy. Students who feel "close" to their goal are likely to be those who *expect* to attain it. Students who do *not* feel "close" to their goal are likely to be those who have lower (goal attainment) expectancy. In short, "self-efficacy" and "goal approach" are extremely similar to expectancy,

[5] Total "self-efficacy" scores are the *sums* of the scores on the three items. Mean "self-efficacy" scores are the *mean* of the scores on the three items. Given that a 1-6 scale appears to have been used, the minimum and maximum possible total scores are 3 and 18, respectively. The minimum and maximum possible mean scores are 1 and 6, respectively.

[6]Although considerably higher than the pretest mean of the PF condition, the pretest mean of the SF condition (9.63) was far from the maximum possible total score (18). There was therefore little to suggest a ceiling effect. That is to say, the lower pre-to-post change in the SF condition in Asai (2017) (relative to the pre-to-post SF change in other studies and the pre-to-post *PF* change in Asai's (2017) study) cannot be explained by the higher pretest SF mean (relative to the pretest PF mean) in Asai's (2017) study. As far as scores on the "self-efficacy" scale are concerned, participants in the SF condition in Asai's (2017) study *could* have experienced a larger gain from pretest to posttest than they actually did. They could also have experienced a gain from pretest to posttest similar in size to that experienced by the PF condition (although in fact they did not).

[7]In the three identified studies, "Goal Approach" was measured by a single item (on the 0 to 10 scale). Thus the minimum and maximum possible scores were 0 and 10 respectively and mean scores and total scores are the same.

[8]The data associated with the study reported by Asai (2017) were obtained as follows. The author contacted Mark Beyebach - one of the researchers involved in the studies reported by Neipp et al., (2016a, 2016b) - and asked about other unpublished data. Mark Beyebach did not have any further data to share. However, one month later he emailed the author, having learned about a Japanese researcher's "null" (and unpublished) findings. He provided the author with the contact details of the Japanese researcher. The author emailed the researcher and obtained the details and data for the study reported in Asai (2017).

[9]MCII (Mental contrasting with implementation intentions) was developed by Gabriele Oettingen and Peter Gollwitzer (Oettingen & Golwitzer, 2010). It is a brief (largely) problem-focused goal-setting and planning intervention designed to increase commitment and goal attainment. In a typical case of MCII, individuals are initially asked to identify and imagine the "best thing" about attaining their goal. Then they are asked to identify and imagine the biggest obstacle in their way. Finally, they are asked to formulate an "if/when…then" plan that specifies what they will do if the obstacle arises, e.g. "If I feel too lazy to start my essay, then I will get out my laptop and start writing." When students have at least moderately high expectancy, MCII appears to be an effective means of increasing goal attainment (e.g. Duckworth et al., 2011).

[10]It is important to note that statistical mediation analysis does not "*prove*" that an independent variable (X) has an indirect effect on a dependent variable (Y) via some putative "mediator" (M). In order to be confident in asserting that X has an indirect effect on Y through M, one must be confident that X has a causal effect on M *and* that M has a causal effect on Y. In the study conducted by Abdulla and Woods (2021b), the independent variable (X) is "SF questions about resources" vs "PF questions about obstacles" vs "SF questions about resources *and* PF questions about obstacles, the putative mediator is expectancy, and the dependent variable is commitment. Random assignment means that one can be confident that X (experimental condition) causes M (expectancy). However, individuals cannot be randomly assigned to different levels of expectancy (the "mediator"). Instead, different levels of expectancy are *observed* in the dataset. (Observed) expectancy is then associated with commitment. The question therefore remains whether differences in expectancy *cause* differences in commitment. It is beyond the scope of

this thesis to address the question in detail. Suffice it to say that researchers and theorists generally assume that expectancy does indeed have a causal effect on commitment (e.g. Klein et al., 2013).

[11]The reader may wonder *why* "what's going well" should be associated with greater improvement expectancy than "what's *not* going well." After all, if students feel that something is already "going well" then perhaps they see *less* room for improvement than when something is "not going well." However, research by Critcher and Rosenzweig (2014) suggests that students apply a "performance heuristic." That is to say, if students perceive performance to be good then they consider themselves to have a higher chance of improvement than if they perceive performance to be bad.

[12]The author also conducted a large study focusing on the "Miracle Question," which is currently under review.

[13]"Writing ideation" includes generating ideas for written work and expressing those ideas in writing.

[14]The title of the author's 2021 paper was: "Asking students to recall success may *not* enhance their perceived self-efficacy" (italics added here). The author would now prefer the title: "Asking students to recall success may do *little* to enhance their perceived self-efficacy." The editor and reviewers who read the author's manuscript were (like the majority of editors and reviewers in psychology) advocates of null hypothesis significance testing (NHST). NHST leads to dichotomous thinking. That is, it encourages researchers to ask the question: "Is there an effect? Or not?" The author now has major reservations about this approach and about NHST in general. Rather than asking whether there is a ("significant") effect, researchers should ask *how large* the effect is likely to be. This is what Cumming (2012) refers to as "*estimation* thinking." In both of the experiments conducted by Abdulla (2021), students asked to recall relevant success reported higher perceived self-efficacy than students in the comparison condition(s). The estimated "advantages" were, however, very small in both cases. The title "Asking students to recall success may do *little* to enhance their perceived self-efficacy" reflects estimation (rather than dichotomous) thinking and is therefore more appropriate.

[15]Examples of “success scaling” questions include: “What is the highest level of success that you have achieved on a scale from 0 to 10?” “How did you reach that point on the scale?” “How could you go up one point?”

[16]Recall that the “ease-of-retrieval” hypothesis is that ease/difficulty in recalling success lowers perceived self-efficacy. According to a “reverse causation” objection, it is in fact higher/lower (baseline) PSE that causes greater ease/difficulty in retrieval. Abdulla (2021, Experiment 2) addressed this objection by measuring baseline PSE and including it in the regression model. The hypothesised association between ease-of-retrieval and PSE was still observed (even when baseline PSE was statistically controlled). In other words, amongst students who had the *same baseline level* of perceived self-efficacy (PSE), the easier/more difficult it was to recall success, the higher/lower the posttest PSE. This supports the hypothesis that ease/difficulty causally affects PSE.

[17]Like Abdulla (2021), Abdulla and Woods (2022) addressed the “reverse causation” objection by measuring the key variable at baseline and including it in the regression model. Note that in the 2022 study the hypothesis is that greater ease/difficulty in generating means of goal attainment raises/lowers goal attainment expectancy (or “perceived goal attainability” - PGA - as it is described in the study) in students with lower baseline PGA. According to the “reverse causation” objection, it is in fact higher/lower (baseline) expectancy that causes greater ease/difficulty in generation. Abdulla and Woods (2022) found that amongst students with the *same (relatively) low level of baseline expectancy*, greater ease/difficulty in generation was associated with higher/lower posttest PGA. This supports the hypothesis that ease/difficulty in generation causally affects (posttest) PGA.

[18]Equally, however, the results reported by Abdulla and Woods (2022) imply that *ease*-in-generation may have *positive* side-effects. This suggests that SF practitioners would do well to facilitate the generation of means. Telling the coachee how (s)he can attain a goal (i.e. providing a list of means) would not be in keeping with the non-directive ethos of coaching. However, a skilful SF coach may be able to facilitate the generation of means by asking particularly effective questions, e.g. “What has worked for you in the past?”

[19]The author has now conducted two large multi-experiment studies that involve both females and males. In both studies (under review) dependent variables include expectancy. One of these studies compares the effects of the terms “weakness” and “area for improvement” in students in both secondary school (Experiment 1) and university (Experiment 2). The results of Experiment 2 suggest that the effects of the terms may indeed depend on gender. The second study (involving males and females aged 17-76) compared the “Miracle Question” against a problem-focused and neutral coaching intervention. Two of the experiments in this study suggest that positive effects of the “Miracle Question” may be restricted to (or at least greater in) males. Thus future research on written SF/PF questions would do well to consider gender as a potential moderator.

[20]It is important to remember, however, that SF advocates argue that SF approaches can be effective *in a single session* (e.g. Ratner et al., 2012). They also often assert that SF approaches can deliver *immediate* results (e.g. Jackson & McKergow, 2011). This makes it important to examine the immediate effects of SF questions delivered (and answered) just once.

[21]Comparing effect size estimates across different studies is much more difficult than many researchers/commentators assume. First, different studies use different measures (and sometimes even different dependent variables). Second, different studies often involve different populations. Third, within-group variance (and therefore standard deviations) may vary considerably from study to study. If so, then standardised effect size estimates (e.g. Cohen’s *d*) will also vary from study to study *even if the actual effect of interventions is the same*. This follows from the fact that a standardised effect size estimate such as Cohen’s *d* involves dividing a raw mean difference by a standard deviation that is calculated (or rather estimated) from the data in a given study. If the observed variance in a study is small/large, then the standard deviation will be small/large, which will lead to large/small standardised effect size estimates (since the raw mean difference is being divided by a small/large number). Importantly, however, variances/standard deviations differ from study to study. For example, the variance in highly homogeneous samples (e.g. 11 year old girls in the same class in the same school) is likely to be smaller than the variance in heterogeneous samples (e.g. students aged 18-30 in different schools across the world). A standardised effect size estimate in the first (“homogeneous samples”)

case is therefore likely to be larger than a standardised effect size estimate in the second case *not* because the effect was "larger" in the first case but simply because of the lower variability in scores on the dependent variable (which leads to a smaller standard deviation, and therefore a larger Cohen's *d*). This problem is highlighted by Simpson (2018). It may seem that one way to solve the problem is to compare *raw* effect size estimates rather than standardised effect size estimates. However, this is possibly only when studies use precisely the same measure/scale, which is often not the case. The author therefore hesitates to say that longer SF interventions involving human interaction are associated with "larger" effect size estimates than those calculated in the author's own studies. However, certain multi-session SF interventions (involving human interaction) do appear to have had (moderately) large positive effects. Whether these effects are due to the length of the intervention or to the element of human interaction is not clear.

[22]Two of the author's additional studies (currently under review) measured several *other* dependent variables including goal clarity. hope, affect, perceived stability, perceived controllability and perceived value. These are all psychological variables measured through self-report. The author also intends to conduct studies (of SF/PF questions) in which behavioural outcomes are also assessed.

Appendix A
Solution-Focused Approaches and Techniques

Table 1.

Typical Solution-Focused Approaches and Their Problem-Focused Counterparts

Solution-Focused Approach	Problem-Focused Approach
Focusing on “what’s going well”	Focusing on “what’s *not* going well”
Asking people about resources	Asking people about obstacles
Examining previous success	Examining previous failure
Exploring people’s strengths	Exploring people’s weaknesses
Describing preferred solutions	Describing current problems

Table 2.

Common Solution-Focused Questions/Techniques[a]

SF Question/Technique	Example(s)
Scaling Questions	"On a scale from zero to ten, with ten representing the best it can be and zero the worst, where would you say you are today?" "In the past, have you ever been higher up the scale? How did that happen?" (O'Connell et al., 2013, p.72)
Miracle Question(s)	"Suppose you were to go home tonight, and while you were asleep, a miracle happened and this problem was solved. How will you know the miracle happened? What will be the difference?" (de Shazer, 1988, p.5)
Questions About "Exceptions"	"When does the problem *not* occur?" (Franklin et al., 2008, p.41, italics added)
	"When was the last time you were successful in school?" "What did you do then that worked?" (Metcalf, 2008, p.42)
Questions About Current Success	"What's going well at the moment?" (Adams, 2015, p.95)
Questions about Recent Improvements	"What's better since we last met?" (Milner & Bateman, 2011, p.26)

Questions About “Resources”	“What do you have that helps you?” (Sparrer, 2007, p.19) “Who could support you in this?” (Rohrig & Clarke, 2008, p.225)
“Small Steps”	“What small step are you willing to take next week to move a little closer to your goal…?” (Murphy, 2015, p.123)
Compliments	“What you achieved last week shows how resourceful and determined you are.” (O’Connell et al., 2012, p.61)
Eliciting More Ideas/Solutions	“What else could you do?” (Sundman et al., 2020, p.60) “How else could you get the same thing?” (Proudlock, 2017, p.99)
“Coping” Questions	“How are you managing to cope with this to the degree that you are?” (de Shazer & Dolan, 2021, p.10)

[a] The (types of) SF questions listed in this appendix are those that are found most frequently in the SF texts written by the founders of solution-focused brief therapy (e.g. de Jong & Berg, 2012; de Shazer & Dolan, 2021).

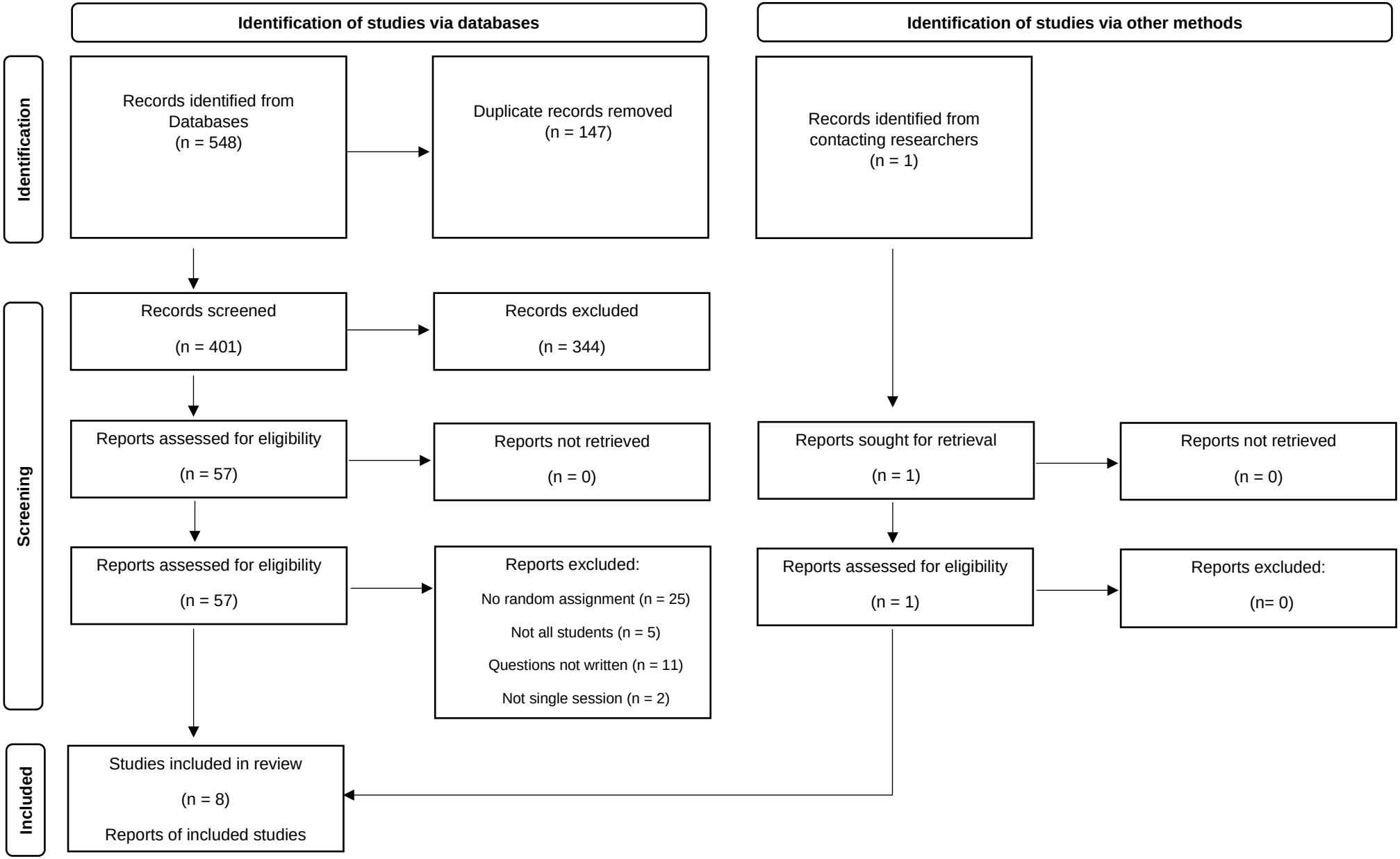
Appendix B
Search Terms Used in the Literature Search for the Systematic Review

- “Solution(-)focused question(s) “expectancy”
- “Solution(-)focused question(s)” “perceived goal attainability”
- “Solution(-)focused question(s)” “(perceived) self-efficacy”
- “Solution(-)focused question(s)” “confidence”
- “Solution(-)focused question(s)” “perceived likelihood”
- “Solution(-)focused question(s)” “goal approach”
- “Solution(-)focused question(s)” “commitment”
- “Solution(-)focused question(s)” “motivation”
- “Solution(-)focused question(s)” “intention”
- “Solution(-)focused question(s)” “hope”
- “Miracle question” “expectancy”
- “Miracle question” “perceived goal attainability”
- “Miracle question” “(perceived) self-efficacy”
- “Miracle question” “confidence”
- “Miracle question” “perceived likelihood”
- “Miracle question” “goal approach”
- “Miracle question” “commitment”
- “Miracle question” “motivation”
- “Miracle question” “intention”
- “Miracle question” “hope”
- “Scaling questions” “expectancy”
- “Scaling questions” “perceived goal attainability”
- “Scaling questions” “perceived self-efficacy”
- “Scaling questions” “self-efficacy”
- “Scaling questions” “confidence”
- “Scaling questions” “perceived likelihood”
- “Scaling questions” “goal approach”
- “Scaling questions” “commitment”
- “Scaling questions” “motivation”
- “Scaling questions” “intention”
- “Scaling questions” “hope”
- “Coping questions” “expectancy”
- “Coping questions” “Scaling questions” “perceived goal attainability”

- “Coping questions” “perceived self-efficacy”
- “Coping questions” “self-efficacy”
- “Coping questions” “confidence”
- “Coping questions” “perceived likelihood”
- “Coping questions” “goal approach”
- “Coping questions” “commitment”
- “Coping questions” “motivation”
- “Coping questions” “intention”
- “Coping questions” “hope”
- “Solution-focused” “resources” “expectancy”
- “Solution-focused” “resources” “perceived goal attainability”
- “Solution-focused” “resources” “perceived self-efficacy”
- “Solution-focused” “resources” “self-efficacy”
- “Solution-focused” “resources” “confidence”
- “Solution-focused” “resources” “perceived likelihood”
- “Solution-focused” “resources” “goal approach”
- “Solution-focused” “resources” “commitment”
- “Solution-focused” “resources” “motivation”
- “Solution-focused” “resources” “intention”
- “Solution-focused” “resources” “hope”
- “Solution-focused” “exceptions” “expectancy”
- “Solution-focused” “exceptions” “perceived goal attainability”
- “Solution-focused” “exceptions” “perceived self-efficacy”
- “Solution-focused” “exceptions” “self-efficacy”
- “Solution-focused” “exceptions” “confidence”
- “Solution-focused” “exceptions” “perceived likelihood”
- “Solution-focused” “exceptions” “goal approach”
- “Solution-focused” “exceptions” “commitment”
- “Solution-focused” “exceptions” “motivation”
- “Solution-focused” “exceptions” “intention”
- “Solution-focused” “exceptions” “hope”
- “Solution-focused” “compliments” “expectancy”
- “Solution-focused” “compliments” “perceived goal attainability”
- “Solution-focused” “compliments” “perceived self-efficacy”
- “Solution-focused” “compliments” “self-efficacy”

- “Solution-focused” “compliments” “confidence”
- “Solution-focused” “compliments” “perceived likelihood”
- “Solution-focused” “compliments” “goal approach”
- “Solution-focused” “compliments” “commitment”
- “Solution-focused” “compliments” “motivation”
- “Solution-focused” “compliments” “intention”
- “Solution-focused” “compliments “hope”

Appendix C
Flow Diagram Depicting Results of Each Stage in the Literature Search



Appendix D
Data Extraction Form Used in the Systematic Review

Date of retrieval:	
How was the study found/retrieved? e.g. Google scholar? Reference list?	
Year of publication:	
Publication status: - Published journal article? - Unpublished report?	
Researcher/research characteristics: - Discipline? - University? - Funded?	
Nature of Participants: - Age - Gender - Nationality - Ethnicity - Socioeconomic status - Education Level	
Nature of Sample: - Sample size? - Random sample? - Convenience sample? - Self-selecting?	
Manipulation/Independent variable(s)[a] - What exactly was manipulated? - What was done in each experimental condition?	
Dependent Variables? - What were the DVs? - How were these measured?	
Study Design:	

- True experimental? (Random assignment) - Quasi-experimental? - Pretest posttest? - Number of sessions? Single-session?	
Study delivery - Remote? Digital? On paper? - In person?	
Attrition/Drop-out/Missing data? - Reported?	
Summary Data for Effect Size Estimates - Means and standard deviations for each condition	

[a] In extracting information about the manipulation/independent variable(s), the author made a list of the questions that were used in each experimental condition. The author then compared the questions used in the studies with the categories/types of questions listed in Appendix A (Table 2). There are no 'canonical' versions of SF questions that all SF practitioners are compelled to use. The wording of SF questions is flexible. 'Scaling questions' (e.g. 'Where would you say you are now on a scale between 0 and 10?') may not include the word 'scale.' de Shazer and Dolan (2021, p.76) provide a good example: 'Where would you say things are between 0 and 10?' This question clearly qualifies as a 'scaling question' although it does not use the word 'scale.' Similarly, the 'Miracle Question' may be asked in many different ways and, as Quick (2008, p.36) points out, 'use of the word "miracle" is *not* a requirement' (italics in original).' Hanton (2011, p.77), for example, uses the expression "something wonderful" (instead of "miracle"). Kayrouz and Hansen (2017) provide examples of other adaptations. The author therefore did not characterise interventions/questions by referring to an unalterable "canon." Instead, the author attempted to fit the questions used into one of the familiar categories, e.g. "scaling question," "Miracle question," "small steps," "exceptions" etc. (see Table 2 in Appendix A for the categories/types of question). An intervention could then be characterised as i) a "single-category" (or "single-type") intervention if it presented students with just one category/type of question (e.g. 'exceptions'), or ii) a "battery" intervention if it presented students with *multiple* categories/types of question (e.g. "Miracle question" + "Small steps" + "Exceptions").

There is inevitably some subjectivity in characterising questions in the above manner. For example, one reader may consider a particular question to be a version of "small steps" whereas another may not characterise it in that manner. If the author had been part of a *team* conducting the review, then other members of the team would have been asked to characterise the questions as well and inter-rater agreement would have been estimated. Given the constraints of a PhD (which requires students to work alone), the author relied on his own judgement and experience. The author has read hundreds of solution-focused papers, articles and books, has been formally trained in solution-focused coaching and has himself authored a carefully-researched book on solution-focused (cognitive-behavioural) coaching (Abdulla, 2017). He is therefore confident in the validity of his characterisations. Moreover, although some readers may disagree with the categorisation of a particular question, fewer (if any) would disagree with the characterisation of a study as a "single-category" or "battery." It is easier to notice that *more than one* type of question has been asked (i.e. that a battery has been presented) than it is to characterise each type of question

precisely. The author therefore believes that his characterisation of studies as ‘single-category’ or ‘battery’ is unlikely to be contested.

Appendix E
Studies Meeting Several but not All Inclusion Criteria

Study	SF questions/ techniques compared against PF (or Neutral) questions / techniques?	Participants Randomly Assigned to Conditions?	Participants (all) Students?	Questions / Techniques Delivered in Writing?	Single Session?	Dependent Measures Included Expectancy or Commitment (vel sim)?	Published between 1988 and 2020?	Enough Information to estimate an effect size?	Study Report in English?
Fruwert (2013)	Yes	Yes	Yes	Yes	Yes	No[a]	Yes	No	Yes
Grant & O'Connor (2010)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gribbin (2017)	No	No	Yes	Yes	No	No	Yes	No	Yes
Richmond (2007)	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes
Theeboom et al. (2016)	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Terni (2014)	Yes	Yes	Yes	Yes	Yes	Yes[b]	Yes	No	Yes

[a]Fruwert (2013, p.12) writes that participants were asked to indicate "how motivated they were to follow the steps" but no outcome data are reported for this variable. Instead, "energetic arousal" scores are recorded.

[b]Terni (2014, p.18) writes that participants were asked "how confident" they were that they were going to "stick to" their study goals. However, no outcome data are reported for this measure.

Appendix F
Characteristics of Studies Included in the Systematic Review

Study	Report type	Nature of Students / Educational institution	Age of participants	Sample size	Female (%)	SF condition	Comparison condition	Relevant dependent measure(s)
Asai, K. (2017)	Poster presentation	Undergraduates (subject not indicated) /Japanese university	Mean = 20.11 SD = 1.64	132	65%	Battery of SF questions (translated into Japanese)	Battery of PF question (translated into Japanese)	“Self-efficacy”; “Goal approach”
Braunstein & Grant (2016)	Published journal article	Psychology undergraduates / Location of university not provided	Mean = 20.27 SD = 5.42	142	66%	Battery of SF questions	Battery of PF questions	“Self-efficacy”; “Perceived goal progress”
Grant (2012)	Published journal article	Psychology undergraduates / Australian university	Mean = 20.5 SD = 5.4	225	75%	Battery of SF questions	Battery of PF questions	“Self-efficacy”; “Goal approach”
Grant & Gerrard (2020)	Published journal article	Psychology undergraduates / Location of university not provided	Mean = 19.56 SD = 3.55	80	71%	Battery of SF questions	Battery of PF questions	“Self-efficacy”; “Goal attainment”
Grant & O’Connor (2018)	Published journal article	Psychology undergraduates / Australian university)	Mean = 19.77 SD = 4.51	512	71%	Battery of SF questions	Battery of PF questions	“Self-efficacy”; “Goal approach”
Neipp et al. (2016a)	Published journal article	Nursing & Psychology students / Spanish university	Mean = 20.5 SD = 5.02	204	78%	Battery of SF questions (translated into Spanish)	Battery of PF questions (translated into Spanish)	“Self-efficacy”; “Goal approach”

Neipp et al. (2016b)	Poster presentation	Nursing students / Spanish university	Mean= 21.79 S.D. = 5.71	107	79%	Battery of SF questions (translated into Spanish)	Battery of PF questions (translated into Spanish)	“Self-efficacy”; “Goal attainment” (no data given)
Wehr (2010, Experiment 2)	Published journal article	Psychology undergraduates / University of Trier	Mean = 24.0 (SD not provided)	92	73%	Recalling “exceptions” (to “problems”)	Recalling “problem” situations	“Confidence”

Appendix G
Summary of the Results of the Risk of Bias Assessment for Studies Included in the Systematic Review

Study	Risk of Bias in Randomisation	Risk of Bias in Deviation from intended interventions	Risk of Bias in Missing Outcome data[a]	Risk of Bias in Measurement of the outcome	Risk of Bias in Selection of the reported outcome[b]	Overall Risk of Bias Asessment
Asai (2017)	Low	Low	Some concerns	Low	Low	Some concerns
Braunstein & Grant (2016)	Low	Low	Some concerns	Low	Low	Some concerns
Grant (2012)	Low	Low	Some concerns	Low	Low	Some concerns
Grant & Gerrard (2020)	Low	Low	Some concerns	Low	Low	Some concerns
Grant & O'Connor (2018)	Low	Low	Some concerns	Low	Low	Some concerns
Neipp et al. (2016a)	Low	Low	Some concerns	Low	Low	Some concerns
Neipp et al. (2016b)	Low	Low	Some concerns	Low	Some concerns	Some concerns
Wehr (2010)	Low	Low	Some Concerns	Low	Low	Some concerns

[a] Sterne et al. (2019) suggest that if no information is provided about the extent of missing outcome data then a high risk of bias will normally result. However, two factors mitigate the concerns in the present review. First, the Cochrane risk-of-bias tool was primarily designed for extended trials in a healthcare/medical context. The number of patients dropping out of an extended medical trial may be fairly high (as a result of adverse events), which can cause a significant 'missing data' problem. On the other hand, the studies included in the present systematic review were brief single-session interventions. Such interventions may be completed in just 10-15 minutes, which considerably reduces the risk of drop-out (and missing data). The author was able to obtain the raw data for Asai's (2017) study and to investigate the issue of missing data directly (at least for that study). Inspection of the data-set indicated that 93% of (randomly assigned) participants who began the study provided outcome data for all the measures. Wehr (2010) reported that (only) one participant failed to complete the experiment. If the other studies in the review had similarly high completion rates, then the risk of bias arising from missing outcome data may not be very high. A verdict of "some concerns" (rather than "high risk of bias") was therefore recorded for (missing) outcome data.

[b] Analysis plans do not appear to have been preregistered for any of the included studies. However, all of the studies except that reported by Wehr (2020) used the same experimental design (the pretest posttest comparison group design) and statistical tests. It is therefore likely that analyses were conducted in accordance with pre-established intentions, which lowers the risk of bias.

Appendix H
Summary Data for Experimental Conditions and Estimated Effect Sizes in Included Studies

Study	Variable(s)	Measure / Scale	Pretest Mean of SF condition	Pretest Mean of PF condition	Posttest Mean of SF condition	Posttest Mean of PF condition	Raw Mean Posttest Difference (SF – PF)	Raw Pretest Posttest Effect Size Estimate[a]	Standardised Mean Posttest Difference[b] (Cohen's *d*)	Standardised Pretest-Posttest Effect Size Estimate[c]
Asai (2017)	Self-efficacy	Sum of three items / 1 to 6	9.63 (SD = 3.17)	8.36 (SD = 3.56)	9.94 (SD = 3.42)	8.69 (SD = 3.70)	1.25 [0.09,2.41]	-0.02 [-0.78, 0.74]	0.37 [0.03,0.71]	-0.01 [-0.02, 0.00]
	Goal Approach	1 item / 1 to 10	4.51 (SD = 1.99)	3.75 (SD = 1.72)	4.82 (SD = 1.99)	3.93 (SD = 1.79)	0.89 [0.24,1.54]	0.13	0.47 [0.12,0.82]	0.07
Braunstein & Grant (2016)[d]	Self-efficacy	Sum of three items / 1 to 6	10.71 (SD = 3.08)	11.21 (SD = 3.45)	13.17 (SD = 3.10)	11.71 (SD = 4.05)	1.46 [-0.27,3.19]	1.96	0.45 [-0.03,0.92]	0.60
	Perceived Goal Progress	one item / 0-100	49.43 (SD = 20.71)	52.65 (SD = 25.74)	61.43 (SD = 20.17)	55.00 (SD = 25.14)	6.43 [-4.51,17.37]	9.65	0.28 [-0.19,0.76]	0.41
Grant (2012)	Self-efficacy	Sum of three items / 1 to 6	8.12 (SD = 3.76)	8.17 (SD = 3.27)	10.03 (SD = 4.31)	8.53 (SD = 3.69)	1.5 [0.44,2.56]	1.55	0.42 [0.16,0.69]	0.44
	Goal Approach	one item / 0-10	3.86 (SD = 2.41)	3.37 (SD = 3.32)	4.98 (SD = 2.52)	3.94 (SD = 2.33)	1.04 [0.40,1.68]	0.55	0.43 [0.10,0.62]	0.23
Grant & Gerrard (2020)	Self-efficacy	sum of three items / -3 to +3	-1.10 (SD = 3.33)	0.48 (SD = 5.10)	4.13 (SD = 3.35)	1.89 (SD = 4.85)	2.24 [0.05,4.43]	3.82	0.52 [-0.00,1.04]	0.89
	Goal Attainment	one item / 0-100	49.14 (SD = 18.29)	52.89 (SD = 23.68)	66.79 (SD = 19.69)	60.48 (SD = 24.86)	6.31 [-5.49, 18.11]	10.06	0.30 -0.22,0.82]	0.48

Grant & O'Connor (2018)[e]	"Self-efficacy"	one item / scale not specified	3.34 [SD =1.33]	3.41 [SD = 1.23]	3.91 [SD = 1.48]	3.47 [SD = 1.34]	0.44 [0.09,0.79]	0.51	0.34 [0.10,0.59]	0.40
	"Goal Approach"	one item / 0-10?[f]	4.87 [SD =2.47]	5.10 [SD =2.32]	6.02 [SD =2.59]	5.76 [SD =2.42]	0.26 [-0.58,1.10]	0.49	0.11 [-0.14,0.35]	0.20
Neipp et al. (2016a)	"Self-efficacy"	Sum of three items / 1 to 6	9.77 [SD =3.63]	10.42 [SD =4.29]	11.70 [SD =4.01]	10.88 [SD =4.38]	0.82 [-0.34,1.98]	1.47	0.21 [-0.07,0.48]	0.37
	"Goal Approach"	one item / 0-10	5.16 [SD =2.13]	5.21 [SD =2.49]	5.88 [SD =2.37]	5.51 [SD =2.72]	0.37 [-0.33,1.07]	0.42	0.16 [-0.12,0.44]	0.18
Neipp et al. (2016b)	"Self-efficacy"	Measure and scale not specified[g]	10.72 [SD =3.71]	11.54 [SD =4.31]	12.42 [SD =4.13]	12.00 [SD =4.32]	0.42 [-1.20,2.04]	1.24	0.10 [-0.28,0.48]	0.31
Wehr (2010, Experiment 2)[h]	"Confidence"	One item?[i] / 7-point scale	N/A	N/A	4.58 [SD =1.66]	5.33 [SD =1.65]	-0.75 [-1.73,0.23]	N/A	-0.45 [-1.04,0.13]	N/A

Note. SD = Standard Deviation; N/A = Not Assessed/Not Applicable

[a]The raw pretest posttest effect size estimate was calculated by subtracting the mean pre-post change in the problem-focused condition from the mean pre-post change in the solution-focused condition. Calculation of the (estimated) standard error of this quantity requires knowledge of the pretest-posttest correlation, which was not reported in any of the write-ups. The author was able to obtain raw data from Keigo Asai who conducted the first study (Asai, 2017). This made it possible to calculate the pretest-posttest correlation for the "self-efficacy" variable in that study, which in turn made it possible to derive an estimate of the standard error required for the associated CI. However, CIs could not be calculated for any variables in any other study (since the necessary pretest-posttest correlation was not reported).

[b]The standardised mean posttest difference was calculated by dividing the raw mean posttest difference by the pooled pretest standard deviation. In the case of Wehr (2010, Experiment 2), the pooled posttest standard deviation was used since there was no pretest.

[c]The standardised pretest posttest effect size estimate was calculated by subtracting the mean pre-post change in the problem-focused condition from the mean pre-post change in the solution-focused condition and dividing the result by the pooled pretest standard deviation. This formula is

proposed by Carlson and Schmidt (1999). Morris (2007) proposes a very similar formula, which involves a correction for small sample bias. Such corrections are generally recommended only when sample sizes are small, e.g. <20 (Card, 2012). In the present systematic review, all sample sizes were (moderately) large. As a result, a correction for "small sample bias" was not considered necessary or appropriate. Confidence intervals (CIs) for the standardised pretest posttest effect size estimate require (an estimate of) the standard error, the calculation of which also requires knowledge of the correlation between pretest and posttest scores. As already noted, that correlation was not reported in any of the write-ups. Confidence intervals for the standardised pretest posttest effect size estimates could therefore not be calculated, except for the "self-efficacy" variable in the study reported by Asai (2017).

[d]The data presented in the table are those associated with the researchers' "approach goal" condition. In the "avoidance goal" condition, pretest mean "self-efficacy" in the SF condition (M=11.22; SD = 3.11) was almost identical to pretest mean "self-efficacy" in the PF condition (M=11.21; SD = 3.91). However, mean "self-efficacy" at posttest was higher in the SF condition (M = 13.65; SD = 2.76) than in the PF condition (M = 12.09; SD = 4.43). The raw mean posttest difference was 1.56[-0.17,3.29] and the standardised posttest mean difference was 0.43 [-0.05,0.89]. The standardised pretest-posttest effect size estimate was 0.44. At pretest, mean "perceived goal progress" was higher in the SF condition (M = 48.92, SD = 24.70] than in the PF condition [M = 45.88; SD = 24.76]. At posttest, mean "perceived goal progress" was higher still in the SF condition (M=61.98; SD = 24.93) than in the PF condition (52.35; SD = 26.18]. The raw mean posttest difference was 9.54[-0.10,0.84] and the standardised mean posttest difference was 0.37[-0.10,0.84]. The standardised pretest-posttest effect size estimate was 0.26.

[e]Grant & O'Connor (2018) compared their SF condition not only against a PF condition but also against a "positive affect" (PA) and combined SF+PA condition. At pretest, mean "self-efficacy" was slightly higher in the PA condition (M=3.42, SD = 1.42) than in the SF condition (M=3.34; SD=1.33). At posttest however, mean "self-efficacy" was higher in the SF condition (M=3.91; SD = 1.48) than in the PA condition (M=3.78; SD=1.38). The raw mean posttest difference was 0.13[-0.22,0.48] and the standardised mean posttest difference was 0.09[-0.16,0.34]. The standardised pretest-posttest effect size estimate was 0.15. At pretest, mean "goal approach" was very slightly higher in the SF condition (M=4.87; SD=2.47) than in the PA condition (M=4.83; SD=2.35) At posttest, mean "goal approach" was higher still in the SF condition (M=6.02; SD=2.59) than in the PA condition (M=5.75; SD = 2.60). The raw mean posttest difference was 0.27[-0.37,0.91] and the standardised mean posttest difference was 0.10[-0.14,0.35]. The standardised pretest-posttest effect size estimate was 0.10.

[f]The researchers state in their paper that they used a 0-100% scale for "Goal Approach." However the outcome data reported for "Goal Approach" in fact appear to be on the 0-10 scale used in other studies.

[g] Although the poster presentation in Neipp et al. (2016b) does not specify the measure or scale used for the "self-efficacy" variable, they are likely to have been the same as in Neipp et al. (2016a) since the studies appear to be (exact) replications.

[h] The data presented in the table are those associated with the researcher's "1 situation" condition. The experiment also involved a "5 situations" condition in which participants were asked to identify five examples of [exceptions to] the "problem." When the two "5 situations" conditions are compared, the SF condition (M = 5.00; SD = 1.66) had higher mean confidence than the PF condition (M = 4.20; SD = 1.63). The raw mean posttest difference was 0.8 [-0.18,1.78] and the standardised mean posttest difference was 0.48 [-0.11,1.06].

[i]Wehr (2010) does not make it clear (in the main paper) how many items were used to measure "confidence" but it appears that only one item was used. The main text states that a 7-point scale was used but no further information is provided

Appendix I

Solution-Focused and Problem-Focused Questions Originally Compared by Grant (2012)

Solution-Focused Questions	Problem-Focused Questions
● "Think about a possible solution to the problem you have just described. Now, imagine the solution had somehow 'magically' come about. Describe the solution"	● "How long has this been a problem?"
● "Describe some ways you could start to move towards creating this solution"	● "How did it start?"
● "What are your thoughts about this solution?"	● "What are your thoughts about this problem?"
● "How do you react when you have these thoughts?"	● "How do you react when you have those thoughts?"
● "What impact is thinking about this solution having on you?"	● "What impact is thinking about this issue having on you?"

Appendix J: Publications Included in Author's PhD Portfolio

Publication	What the Author did
Abdulla, A. (2021). Asking students to recall success may not enhance their perceived self-efficacy. *Learning and Individual Differences, 101984.*	This paper was based on the author's Master's degree thesis. The author did everything himself, including reading the relevant material, designing the study, collecting the data, analysing the data and writing the manuscript. The manuscript was almost entirely rewritten after the author's Master's Degree. Data analyses were reconducted (in accordance with up-to-date recommendations made by quantitative methodologists); the theoretical background was significantly expanded; and the manuscript then underwent multiple revisions (requested by reviewers) before it was finally published. In short, a great deal of work was required (after the author's Master's degree) before this paper could be published.
Abdulla, A., & Woods, R. (2021a). Comparing mental contrasting with implementation intentions against solution-focused and autonomous planning. *School Psychology International, 42*, 398-421.	The author did everything himself, including reading the relevant material, designing the study, collecting the data, analysing the data and writing the manuscript. The author's co-author read the author's manuscript and made suggestions about wording, formatting and argument. The author took some of these suggestions into account before submitting the paper for publication.
Abdulla, A., & Woods, R. (2021b). Obstacles vs. Resources - Comparing the Effects of a Problem-Focused, Solution-Focused and Combined Approach on Perceived Goal Attainability and Commitment. *International Journal of Applied Positive Psychology,* 6, 175-194	The author did everything himself, including reading the relevant material, designing the study, collecting the data, analysing the data and writing the manuscript. On this occasion, the author's co-author was asked to code some of the qualitative data, which allowed the author to estimate inter-rater reliability. The co-author also read the manuscript and made suggestions about wording, etc.
Abdulla, A., & Woods, R. (2021c). The effects of current unsatisfactory performance and evaluative approach on improvement expectancy and commitment to improvement. *Motivation and Emotion.* Advance online publication. https://doi.org/10.1007/s11031-021-09864-=	The author did everything himself, including reading the relevant material, designing the study, collecting the data, analysing the data and writing the manuscript. The author's co-author read the author's manuscript and made suggestions about the wording, formatting and argument. The author took some of these suggestions into account before submitting the paper for publication.
Abdulla, A., & Woods, R. (2021d). The Effect of Solution-Focused Scaling and Solution-Focused Questions on Expectancy and Commitment. *School Psychology Review.* Advance Online Publication DOI: 10.1080/2372966X.2021.1942196	The author did everything himself, including reading the relevant material, designing the study, collecting the data, analysing the data and writing the manuscript. The author's co-author read the author's manuscript and made suggestions about the wording, formatting and argument. The author took some of these suggestions into account before submitting the paper for publication.

Abdulla, A., & Woods, R. (2022). “How Else Could You Do that?” The effects of generating multiple means of goal attainment on female students’ perceived goal attainability. *Contemporary Educational Psychology, 70*.	The author did everything himself, including reading the relevant material, designing the study, collecting the data, analysing the data and writing the manuscript. The author’s co-author read the author’s manuscript and made suggestions about the wording, formatting and argument. The author took some of these suggestions into account before submitting the paper for publication.

Appendix K: The Progression from Study to Study

The author's papers were not published in the order in which the studies were conducted. In addition, each paper was published in a different (type of) journal. The purpose of this appendix is to explain the overarching aims of the author's research programme, to illuminate the progression from study to study and to explain how each study sought to build on the last. SF questions can focus on the past, the present or the future. They may also be used on their own (e.g. a scaling question) or with follow-up questions (e.g. scaling + 1 follow-up question) or they may be combined with other *types* of SF questions (e.g. a scaling question + question about resources + a question about "small steps"). The (types of) SF questions that the author set out to examine were:

1. **Questions about previous success** - focuses on the past
2. **Questions about resources** – focuses on the present
3. **Scaling Questions (plus follow-ups)** – can focus on the past, present or future
4. **"What's going well"** – focuses on the present
5. "**Small steps"** - focuses on the future
6. **Questions designed to elicit more ideas/solutions** - can focus on the past, present or future
7. **The "Miracle Question"** – focuses on the future

Examples of the above (types of) questions can be found in Appendix A (Table 2). The primary research question addressed by the author's research programme was almost identical to the question for the systematic review in Chapter 2: *"What are the effects of single-session, written solution-focused (vs. problem-focused/neutral) questions on female students' perceived self-efficacy/expectancy and commitment?"* The key difference between the author's research question and the question asked in the systematic review is the inclusion of the word "female". The author chose to focus on female students for several reasons, which include the fact that female students are often (relatively) low in expectancy (e.g. Massey et al., 2009). The author's programme covered SF questions about the past, SF questions about the present and SF questions about the future. The author also sought to determine the efficacy of the above (types of) questions (a) when used alone, (b) when used with follow-ups, and (c) when *combined* (in some way) with one another. One of the author's secondary aims was to understand *how* and *why* these questions might affect expectancy and commitment and what might limit (or enhance) their efficacy. Clearly the questions listed above could be combined in hundreds (or even thousands) of different ways (e.g. 1 + 2, or 1 + 3, or 2 + 4, or 1 + 2 + 5, etc) The studies submitted in the author's PhD portfolio obviously could not address every possible combination. It is also important to note that the author's research is ongoing. His study on the "Miracle Question," for example, has yet to be published. For the purposes of this PhD, the author's research programme should be understood as consisting of studies on the first six of the above (types of) questions. The studies submitted in the author's portfolio all take a similar approach. In all cases, female students were randomly assigned to conditions in which they answered (in a single session) written solution-focused (or problem-focused/neutral) questions and then reported their perceived self-efficacy/expectancy and (in some cases) their commitment. The studies differed in terms of *which* of the above (seven) questions were included, whether follow-up questions (in the same category) were asked (e.g. scaling question + follow-up scaling question) and whether the questions were combined with questions in a *different* (SF) category (e.g. scaling question + question about resources). The flow chart on the next page explains the progression from study to study.

1. **Abdulla (2020)** – The author's first study examined a single type of SF question focusing on the past – asking students to recall success. (Very) small (and non-statistically-significant) "effects" were observed. The author wondered whether some students might find it difficult to retrieve examples of past success and whether this might limit the efficacy of the question. Statistical analyses did indeed suggest that the ease/difficulty that students experienced in retrieving past success had positive/negative effects on perceived self-efficacy. The author therefore wondered whether students would find it easier to answer SF questions about the *present* (e.g. questions about current resources), If so, larger (positive) effects might be observed. In addition, the author needed to examine possible indirect effects on *commitment*, which was not measured by Abdulla (2020). These considerations led to the next study.

2. **Abdulla and Woods (2021b)** – This study focused on a single type of SF question focusing on the *present* – asking students to reflect on their current resources. It also included a measure of commitment. Students appeared to benefit from this more than students had benefitted from reflecting on past success (in the author's first study). There was evidence of a moderately large positive effect on expectancy and a small indirect effect on commitment. Statistical mediation analysis suggested that asking about resources affected commitment *via* expectancy. Qualitative analysis shed further light on possible mechanisms and mediators. It was found that students in the PF condition made more reference to "self-regulation" issues, which may have had a negative effect on expectancy. Up to this point, the author had examined an SF question focusing on the past (Abdulla, 2020) and SF questions about the present (Abdulla & Woods, 2021b). However, the author had not yet examined SF questions about the past *and* SF questions about the present together in the same intervention. Moreover, the author had yet to examine the most widely-used type of SF question: scaling questions. The next study was designed with these considerations in mind.

3. **Abdulla and Woods (2021c)** – In this study, the author investigated the effect of a single type of SF question focusing on the present ("what's going well") *together* with a *scaling* question about the past. Abdulla and Woods (2021b) had demonstrated that SF questions (about resources) may affect commitment by enhancing expectancy. This study (Abdulla & Woods, 2021c) built on its predecessor and provided further evidence that SF questions may have positive indirect effects on commitment via expectancy, In this case, "what's going well" was associated with a positive indirect effect on commitment-to-improvement via enhanced improvement expectancy. However, the effect of the scaling question was extremely small. The author therefore wondered whether effects of scaling questions would be larger if *follow-up* (scaling) questions are asked. That possibility was addressed in the next study.

4. **Abdulla and Woods (2021d)** – This study built on the preceding study by adding one follow-up question (Experiment 1) and then two follow-up questions (Experiment 2) to the scaling question used by Abdulla and Woods (2021c). Effect size estimates were still small. Unlike Abdulla and Woods (2021b) and Abdulla and Woods (2021c), Abdulla and Woods (2021d) found little evidence of a positive indirect effect (of the SF questions) on commitment (via expectancy). Scaling questions are at the heart of SF practice**.** However, a typical SF coaching session generally involves more than one type or category of question. The author therefore wondered whether SF questions (e.g. scaling questions and questions about resources) would be more powerful when *combined*. The author's next study was designed to examine this possibility.

5. **Abdulla and Woods (2021a)** – This study *combined* some of the SF questions used in the author's previous studies. Like Abdulla and Woods (2021c) and Abdulla and Woods (2021d), Abdulla and Woods (2021a) included a scaling question in the SF intervention. The SF intervention also included questions about resources (as in Abdulla & Woods, 2021b) and a question about "small steps." Goal commitment (like goal progress) was very similar in all three of the study's experimental conditions. On the one hand, the package of SF questions appeared to be the equal of MCII – a famous (partly problem-focused) intervention. On the other hand, the SF questions had *not* proved themselves to be any more effective. Indeed, they were no more effective than asking students to engage in their own form of planning. At this stage the author wondered whether students might be experiencing an issue similar to the ease-of-retrieval issue examined in his first study (Abdulla, 2020). Perhaps students were struggling to answer the SF questions and perhaps this was having a negative effect on expectancy. One of the follow-up scaling questions asked by Abdulla and Woods (2021d) had invited students to consider how they could make further progress. Similarly, the "small steps" question in Abdulla and Woods (2021a) asked students what they could do to make further progress. The author noted, more generally, that almost *all* SF questions put the onus on the student/coachee to generate "solutions", examples or ideas. It might be the case that ease/difficulty in generating responses to SF questions enhances/limits the efficacy of those questions. The author had found some evidence for this with regard to SF questions about the past (Abdulla, 2020). But no study had examined the issue with regard to SF questions about the *future.* In addition, the author had not examined one of the most widely-used types of SF question: "How/what else…?" (which is designed to elicit more ideas/solutions. The next study was designed with these considerations in mind.

6. **Abdulla and Woods (2022)** –.This study focused on one of the most commonly used SF techniques for eliciting more ideas, namely asking individuals "what else" they can do to make progress towards their goals. In the author's previous studies, participants had been asked to provide one or two ideas. Abdulla and Woods (2022) compared two conditions (in three experiments) – a "think of few (ways to achieve the goal)" condition and a "think of many (ways)" condition. Like the SF questions in the author's previous studies, the "think of few" condition asked students to generate only a small number of ideas. The "think of many" condition, however, asked students to generate many. One of the main aims was to investigate the effect of difficulty-in-generation (i.e. the ease/difficulty experienced by students in generating ideas) on expectancy. As already explained, illuminating the effects of ease/difficulty-in-generation might shed light on the (likely) effects of *all* SF questions that put the onus on the coachee to generate (multiple) "solutions." For example, Abdulla and Woods (2021d) speculated that students in one of the "scaling questions" conditions may have struggled to generate ideas (when asked how they could go up one point on the scale). The author(s) then suggested that difficulty-in-generation may have lowered expectancy. A similar issue may have limited the efficacy of (some of the) SF questions used in the author's previous studies. As noted above, Abdulla (2020) had examined the effects of ease/difficulty of retrieval with regard to SF questions about *the past.* This study (Abdulla and Woods, 2022) examined effects of ease/difficulty in generation with regard to SF questions about *the future*. Like Abdulla (2020), Abdulla and Woods (2022) found evidence to suggest that ease/difficulty in generating responses to SF questions does have a positive/negative effect on expectancy. This led the author to conclude that difficulty (or ease) in generationg responses might be one of the key factors that limit (or enhance) the efficacy of SF questions *in general.*

As already explained, the author's research programme is ongoing. Perhaps the most famous solution-focused question of all – the "Miracle Question" – does not feature in the author's published studies. However, the author has conducted a large study of the "Miracle Question," which is currently under review.