

Using design science research to develop and validate the application of client-oriented psychological approaches illustrated by the design of a solution-focused approach[☆]

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ABSTRACT

In recent years the use of Design Science Research (DSR), a research methodology that has proved fruitful in various domains, has expanded. This contribution shows how the fundamentals of DSR translate into the field of applied psychology and how they might offer formal grounding to novel psychological approaches. The validity value of DSR is illustrated by applying its methodology to the case of solution-focused psychology. This leads to an articulation of the solution-focused approach that allows to be tested along the lines set out by DSR. Finally, recommendations are given for the use of DSR in applied psychology.

1. Introduction

This paper marks the introduction of the application of Design Science Research methodology to the field of applied psychology¹. It should be noted that the term ‘applied psychology’ is used quite literally throughout this paper and concerns the client-oriented application of psychological methods. The applicability of the methodology is illustrated using a case problem from the school of solution-focused psychology.

1.1. Design science research

In *The Sciences of the Artificial* (1969) Herbert Simon explores the fundamental differences between the natural sciences and the sciences of the humanities. He suggests a *science of design* that is not limited to the physical or technological domain, but also encompasses the social field. It is his thinking that has inspired the construction of Design Science Research (DSR²).

Based on Simon’s idea, Van Aken (2004) and later Denyer et al. (2008) undertake the challenge to formulate the defining characteristics

of this ‘design science’, contrasting it specifically with the ‘explanatory sciences’. Summarizing their results, we may characterize the former as follows:

- DSR is conducted from the *perspective of an involved actor*.
- DSR is driven by an *interest in field problems*, i.e. problems encountered by involved actors in their field of expertise;
- DSR aims for the *production of prescriptive knowledge* (e.g. a protocol, a set of interventions) to solve or reduce the field problems concerned; hence design science is more focused on *knowledge-to-improve* than on *knowledge-to-explain*.
- DSR justifies its research products largely on the grounds of *pragmatic validity*, i.e. rather than referring to its underlying truth, prescriptive knowledge is grounded in the usefulness of its application.

In this context, the research product containing prescriptive knowledge to solve or reduce field problems is referred to as the *design*. This is in accordance with Simon’s frequently quoted statement: *Everyone designs who devises courses of action aimed at changing existing situations into preferred ones* (Simon, 1969). As the above characterization makes clear,

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¹ The term ‘applied psychology’ as used throughout this paper should be taken literally, concerning the client-oriented application of psychological methods.

² DSR = Design Science Research, SoFAP = Solution-Focused Applied Psychology, FST = Family Systems Therapy, PA = Point of Attention, LL = Lesson Learned, BP = Best Practice, BaP = Bad Practice.

DSR offers a discipline-independent paradigm of conducting scientific research.

Design research as a methodology in the social sciences differs from that in technical disciplines because of the characteristics of the problem area. In the physical or technological domain complex projects are usually repeatable with a high degree of precision. This makes a technical-rational approach to design possible (Schön, 1983). However, Gioia et al. (2013) have shown that the domain of design science can be expanded beyond the strictly technological to address field problems involving human interaction. In this case the design delivered will need to reach a level of abstraction that allows it to be used by all professionals working in the field considered: each individual user needs to be able to customize the design into a solution that helps him whenever he encounters the field problem at hand.

In particular, Gioia et al. (2013) state that it is possible to perform a DSR study in the field of applied psychology. The aim of this article is to demonstrate for the first time the methodological width of DSR explicitly in this direction.

1.2. DSR as a means to validate approaches in applied psychology

As stated in the previous section, DSR justifies its research products mainly on the ground of pragmatic validity. Here we will particularly demonstrate how a design resulting from DSR may serve to validate a specific approach in applied psychology. Indeed, consider the position of practitioners who help their clients with a novel approach that they can only justify based on their positive experience. From the perspective of these practitioners, the lack of scientific rigor validating their approach can be interpreted –using terminology from DSR– as a ‘field problem’. Our objective is to show how techniques proposed by DSR can lead to a ‘design’ that is able to provide the required scientific grounding. Following the instruction of Gioia et al. (2013), such a design needs to be sufficiently abstract, allowing for individual customization. The individuals in question that benefit from the design are then the practitioners that ultimately can provide their proposed approach with the required scientific base.

1.2.1. Case: The school of solution-focused psychology

Throughout this paper we will consider as an example the well-known school of solution-focused psychology.

The roots of solution-focused psychology trace back to the practice of the psychiatrist and psychotherapist Dr. Milton Erickson (1901–1980). His intuitive approach to therapy was later theorized and popularized by Steve de Shazer (1940–2005) and Insoo Kim Berg (1934–2007) at the Brief Family Center founded in Milwaukee, USA, in 1978. Solution-focused thinking stems from the idea that traditional problem-oriented psychological theories or models reduce the complexity of the subject studied or limit their applicability to an increasingly narrow spectrum of psychological phenomena.

We will characterize the solution-focused approach by the axioms that underpin its practice:

- Every human being and every human system is fully equipped to cope with life
- Human systems (individuals, families, teams, companies etc.) always have resources at their disposal that they can use to reach their goals.
- However dire the situation may seem, there are always practices that are worthwhile to keep doing.
- There are always practices and behaviours that still work positively in spite of the problem.
- Change works best on a foundation of what works well.

The development of the solution-focused approach included the discovery of iconic techniques such as the so-called ‘miracle question’ and a variety of ‘scaling questions’, although not all developments in solution-focused psychology merit attention. Especially after the death

of de Shazer and Berg, who had shielded the approach against trivialities, their heritage was muddled by a number of unhelpful technical contributions. When one furthermore considers the original aversion to theorized problem-analysis, it is hardly surprising that the school of solution-focused psychology has in certain circles gained the reputation of being unscientific.

Interviews and testimonies with solution-focused practitioners confirm that they often have difficulty conveying the relevance and results of their way of working in debate with their problem-focused colleagues. This makes the solution-focused approach a suitable test-case for the introduction of DSR into the field of applied psychology.

Therefore, besides outlining the abstract methodological theory of DSR, we will illustrate its use by addressing the following field problem:

- Solution-focused practitioners themselves experience or
- receive as criticism
- that their way of working is not sufficiently validated.

With this aim, it will suffice to design a validated protocol that fits within the solution-focused paradigm and that solution-focused practitioners can use to guide the interaction with their clients.

In Section 2 we will describe the general tools offered by DSR methodology to construct such a design and discuss some additional conditions on it. Section 3 will then show how this applies to the case of our field problem in solution-focused psychology, starting with a formulation of the design objective. Section 4 shows the result of our design objective: the explicit design constructed for our case study on solution-focused applied psychology. It derives its validity from evaluation techniques developed in DSR, explained in Section 5. In the conclusion we will discuss the potential impact of DSR on the field of applied psychology.

2. Characteristics of design science research

The DSR methodology is still under development and the authoritative publication summarizing the state-of-the-art DSR-techniques is still to be written. However, much research (particularly PhD research) has recently been dealing with DSR, such that we can apply its methodology responsibly. In this sense, this article simultaneously contributes to the genesis of an increasingly mature DSR-methodology.

2.1. Laying the foundation for the design

Keskin and Romme (2020) state that ‘design-oriented research has ... been proposed as a way to bridge the gap between theory (i.e. rigor) and practice (i.e. relevance), to produce scientific knowledge while solving or reducing complex and relevant field problems’ (p.3). As mentioned in the introduction, the outcome of a DSR study needs to be relevant from the perspective of an involved actor working in the same field where the field problem occurs. To guard the intended design against a lack of significance, we would do well to keep these four conditions in mind during its construction (Van Aken and Andriessen, 2011):

- *Practical relevance*: The design should be relevant for everyday practice in the field. Too much reduction in the number of variables considered, or a too high conceptual level might risk the practical relevance for real-life use of the design.
- *Operational relevance*: Professionals must be able to actually apply the design in their practice. To this end, the design presented must be consistent with the way practitioners are used to operate (face validity), and they must be able to quickly become familiar with the recommended design.
- *Non-obviousness*: This condition refers to the degree to which the theory behind the design exceeds or complements the commonsense theory already in use. Furthermore, any contribution to existing practice should be non-obvious: if the design is seen as a recurrence

of commonly known knowledge, it is less likely to be adopted by practitioners.

- **Appropriateness:** The design should be up-to-date and relevant to contemporary real-life problems in the field.

Some of these conditions already indicate that the design needs to be (implicitly) derived from literature, empirics and evaluated experiences of involved actor(s). Indeed, it is common for a design to build upon insights from the following general research activities.

- **Literature review,** based on key words in the design objective. In most research on testing explanatory hypotheses, it is common to first determine what the gap in literature is, given the research question. This requires an extensive, almost exhaustive review of at least the recent scientific literature. Since DSR is aimed at designing and validating tools and protocols that can be used to address a class of field problems, the literature review component of a design research approach usually is more limited: there is pragmatic, but targeted ‘shopping’ in the scientific and professional literature to find clues for design requirements and design limitations.
- **Networking:** Structured networking with professionals working in the relevant field and familiar with the field problem in case. These might be asked to comment on the relevance of the design objective or to generate ideas about their wishes for the design.
- **In-depth studies** of cases (if available). As stated above, DSR aims for the production of prescriptive knowledge in certain situations. If records exist on previous situations in which the design could have been applied, a cross-case analysis of these might provide helpful insights.

Although all these activities can be carried out before the construction of the design has properly begun, this is certainly not a necessity. The opposite is true: ideally, a design process is iterative. Characteristic of these iterative steps is the continuous incorporation of new empirical data and experience-based insights into the design. This is especially true for:

- **Interviews,** using semi-structured protocols. Before each interview, the available information about the working context of the practitioner is reviewed. These preparations stimulate the efficiency and effectivity of the interviews. After each interview, the following steps are taken: transcribing the interview, identifying key-issues from the interview, and processing new insights into the interview protocol that is to be used in the next iterative round.
- **Simulation based conversations:** On several moments during the iterative design process, the state-of-the-art design is discussed and evaluated with professionals working in the field.

We will expand on these last two research activities in section 2.3.

2.2. The architecture of the design

As said before, DSR aims to combine theoretical knowledge and field understandings into an approach that can be used by practitioners. Knowledge-to-explain is used to develop knowledge-to-improve by scientifically analyzing practical, real-life field challenges and processes. Much of this knowledge is shaped in so-called *design principles* and *design propositions*. These are solution-oriented guidelines for a specific class of problems or challenges.

More specifically, according to Van Aken and Andriessen (2011), a design principle is a general directive to be followed in a certain context, whereas a design proposition offers a concrete solution to be directly applied in a certain context (i.e. an intervention as part of a protocol).

Together, design principles and propositions constitute the (implicit) *building blocks* of the design in statu nascendi.

2.2.1. Design principles

For the sake of organization, it is common to distinguish between different kinds of design principles as derived from the research activities described above.

A review of relevant literature for example will generally lead to the identification of a number of *Points of Attention*, *Limitations* and *Lessons Learned*. In Section 3 we will discuss these in generalized form, taking the liberty to transform all limitations into resource- and future-oriented points of attention. Networking experience on the other hand will allow for some *Best Practices* and *Bad Practices* to be formulated.

2.2.2. Design propositions

In the introduction it was already stated that the design, once delivered, will need to be of a level of abstraction that allows it to be used by all individuals working in the field at hand. This is only possible under the assumption that social systems show comparable patterns that can be studied, as DSR indeed assumes. These patterns do not have causality as in clockwork systems (Boulding, 1956) but they demonstrate sufficient causal potential to take them into account (Pawson and Tilly, 1997).

This view is at the basis of the so-called CIMO-logic that has been developed within the DSR framework. CIMO is short for Context Intervention Mechanism Outcome and consists of a brief description of a particular situation containing the answers to these four questions (Denyer et al., 2008):

- What is the (field) problem? (Context)
- Which action(s) should be taken? (Intervention)
- How do the proposed actions lead to the desired effect? (Mechanism)
- What result can be expected from the action? (Outcome)

Formulating such CIMOs yields design propositions.

In DSR, CIMOs are usually extracted from case studies. Of course, extracting a CIMO from a single case will result in a CIMO with a very specific context. This can be avoided by evaluating resembling interventions in dissimilar cases and identifying the similarities in the underlying mechanisms in order to construct a more general CIMO.

2.3. The construction of the design

For the sake of clarity, we would like to point out that the DSR methodology does *not* require that the building blocks extracted from literature or empirical research – such as CIMOs – are explicitly addressed in the design. They are implicitly recognizable in the design, but it is not required to indicate which building block underlies which rule or part of the design.

The design process in DSR is not a mechanistic exercise in which the design follows logically from the inputs gained. Instead, it is characterized by synthesis-evaluation iterations that *involve a creative leap* as the result of a process of abduction (Van Aken and Andriessen, 2011). The iterations are not purely intellectual exercises, but they are ‘situated’ in the social work context of the researcher. These ongoing situated interactions during the design process between the researcher and the object of study – professionals working on a field problem – are in alignment with Simon (1969) definition of an artifact as *a meeting point – an ‘interface’ in today’s terms – between an ‘inner’ environment, the substance and organization of the artifact in itself, and an ‘outer’ environment, the surroundings in which it operates*.

In this context of constructive evaluation, two methods developed in DSR are of particular interest: α - and β -testing.

Following McKenney and Reeves (2012), an α -test is a way to have design ideas assessed early by experienced actors. By means of interviews, panel discussions, simulation based conversations, surveys, etc., an α -test tests the nascent design for soundness and feasibility:

- **Soundness:** Testing the propositions and principles that underpin the design and how these are operationalised in the design. Soundness also concerns the logical coherence of the design.
- **Feasibility:** Conceptual testing of the design for feasibility in practice, answering questions as: To what extent can the design be used and applied in practice? Which elements still need to be considered? Does the design fit into the relevant environment?

Based on feedback gained from the α -test the design is adjusted.

The β -test can be considered as an indirect form of action-based research because the designer does not participate directly in the test (Stam, 2007). During a β -test, a group of practitioners, preferably not involved in the prior empirical studies, uses all or part of the design in practice to discover operational improvements for applying the design. Participating practitioners then are asked to assess the extent to which the application of the design turned out to be valid, useable and productive. Generalisable knowledge is then inductively extracted to adapt the design.

3. Case: solution-focused psychology

DSR has been proposed as a way to bridge the gap between theory and practice, to produce scientific knowledge while solving complex and relevant field problems. Indeed, it is precisely this gap that causes the 'lack of validation of the way of working' encumbering solution-focused practitioners, as described in the introduction.

DSR requires that research aiming for the elimination of the field problem is conducted from the perspective of an involved actor. Our research was conducted from the perspective of Louis Cauffman, a solution-focused practitioner who has encountered the field problem in many different forms.

In the introduction it was stated that for the field problem to be eliminated, it will suffice to design a validated protocol that fits within the solution-focused paradigm and that solution-focused practitioners can use to guide the interaction with their clients. Based on Cauffman's experience, we decided it was useful to stress as an extra condition that the protocol is highly sensitive to the environment of the client (the material and immaterial context of the client) in order to maintain a broad and realistic view of the challenges the clients face in real life. This led to the following formulation of a design objective:

- To provide a validated
- solution-focused applied psychology protocol
- to help clients in a productive way
- to address their challenges.

The protocol should consider the client's actual context from the start.

From now on, we will refer to our design objective – the solution-focused applied psychology protocol – as SoFAP-P.

Two specifications are useful here. First, we want to emphasize that the word 'protocol' does not imply a standardized procedure or a uniform 'one-size-fits-all' method. Rather it denotes a set of master rules (rules that govern rules at a lower operational level) or instructions that guide the ordering of interventions that a change facilitator can use to work in an effective and efficient manner. The content of the facilitation process comes from the situation in which these master rules can be applied to elicit change and is thus specific to situation X in context Y, with respect to stakeholder(s) Z.

Second, it should be remarked that the word 'productive' is used here with the meaning organizational science has given to the term. In this sense productivity is seen as the product of effectiveness and efficiency. Something is said to be 'effective' when it achieves the intended goal, whereas 'efficiency' indicates a minimal use of resources such as time or money (Stack, 2016). Therefore, when we say that our protocol needs to help clients address their challenges 'in a productive way', it is implicitly

assumed that clients' challenges *can be overcome*. This can be regarded as an implicit design principle: candidate protocols for our design objective are doomed to fail if the existence of a solution for the client is not presupposed.

We will now apply the DSR methodology as outlined in Section 2 to generate useful and explicit design principles and propositions for constructing SoFAP-P.

3.1. SoFAP-P principles

The literature study aimed at finding design principles for the envisioned protocol was twofold and consisted of a broad historical analysis of various methods used in applied psychology (psychoanalysis and psychodynamic approaches; behaviorism and cognitive behavioral therapy; humanistic psychology; family system therapy; Ericksonian practices; solution-focused therapy; and extended solution-focused therapy) completed with a more specific, targeted reading of relevant literature. In this way, we identified 6 points of attention (PAs) and 14 lessons learned (LLs). Furthermore, consulting our network allowed us to formulate 5 best practices (BPs) in solution-focused psychology and 5 bad practices (BaPs).

3.1.1. Principles drawn from the history of applied psychology

For the historic literature study, different developments in applied psychology were considered since the publication of Freud's *Studien über Hysterie* (1885). The scope of this research included psychoanalysis and psychodynamic approaches, behaviorism and cognitive behavioral therapy (CBT), humanistic psychology, family system therapy (FST), Ericksonian practices, and finally solution-focused therapy. For each of these movements, key limitations were identified alongside a number of lessons learned distilled from corresponding practices. Although the evaluated approaches have major application differences, their accumulated limitations and the combined lessons drawn from them reveal certain common factors. In this way, we identified 9 Lessons Learned and 6 general Limitations that were transformed into an equal number of Points of Attention.

For lack of space, only some of the limitations and lessons learned from CBT and FST will be discussed as an example before it is shown what design principles have been distilled from them.

As a major limitation we considered the fact that therapeutic interventions in CBT are based upon a diagnosis of cognitive-behavioral causal chains. Neither the personality of the client nor the influence of his ecosystem is taken into account. This allows for most CBT-interventions to be protocolized, facilitating knowledge transfer, but simultaneously reducing the tailoring of interventions to the needs of a particular individual. This could explain the fairly high drop-out rate in most CBT studies, however good their outcome results.

Family system therapy moves the focus from the intrapsychic functioning of clients to their functioning in an ecosystem (of which the family usually is the most important subsystem). This is a step forward, but FST derives its theoretical insights from sciences that are mechanistic in nature (cybernetics) and therefore cannot fully consider the unpredictable serendipities of life. Furthermore, FST emphasizes its understanding of social interactions and often finds the origin of problems in repetitive patterns of dysfunctional interaction. Change is assumed to lie in changing these patterns, but FST fails to give clear directions for improvement to the individuals of the system.

In combination with limitations and lessons learned from other applied psychology approaches, these findings led to the formulation of the following design principles.

- PA-1 The emphasis in problem-oriented approaches is on the detailed description of problems and corresponding hypothesized causes underlying these problems. These descriptions and the language in which the professional usually converses with the client, are problem oriented. This easily results in a situation where there is

(too) little attention paid to finding a solution to solve the client's problem.

PA-2 The causal linearity from *anamnesis* and *diagnosis* to *therapy* and *prognosis*, often obscures the complexity of each client's life, oversimplifies the situation that causes the problem and thereby reduces the opportunity for robust and sustainable solutions.

LL-1 Refrain from the linearity of anamnesis, diagnosis, therapy and prognosis; work iteratively, recursively and circularly instead.

LL-2 Incorporate the client's actual context directly and explicitly in the approach. This means involving all relevant stakeholders in the client's actual ecosystemic context in such a way that they can contribute additional resources for the client or that they can benefit from the progress of the client or both.

3.1.2. Principles drawn from a targeted literature study

Additional design principles were distilled from a pragmatic literature study. Here are two examples.

Studying the interaction between practitioner and client, Bachelor (1995) established that the success of therapy heavily depends on the attitude the practitioner assumes during sessions with the client. Most progress was made when the practitioner's attitude was attuned to the wishes, goals and learning style of the client. Specifically, Bachelor found that the practitioner should assume an emphatic, friendly and attentive caring attitude in 46% of cases. In 39% of cases however, practitioners would do better to use their expertise to clarify the client's functioning by adopting an insight-oriented stance. In 15% of the cases studied the practitioner should treat the working relationship as a co-operation in which client and practitioner are equally invested, and achieve a collaborative alliance.

From Bachelor's study we deduced:

LL-3 Stimulate a client-driven or -steered approach, instead of a client-oriented or focused one.

As early as 1936 Samuel Rosenzweig argued that 'it is justifiable to wonder whether the factors that actually are operative in several different therapies may not have much more in common than the factors alleged to be operative.' His suggestion (or suspicion) was reinforced by findings from Lambert (1992) and Wampold (2001). The former showed that non-specific factors are mostly responsible for changes caused during psychological facilitation: only 15% of changes could be attributed to method-specific interventions, the remaining 85% could be traced back to the relationship between the client and the practitioner, the hopes and expectations of the client, and extra-therapeutic factors. Wampold (2001) is even more skeptical about the benefit of specific methods, stating that no more than 8% of therapeutic outcomes could be seen as the result of method-specific mechanisms.

Furthermore, Frank & Frank (1991) have specified how these important non-specific or common factors can be activated by the practitioner, yielding a number of facilitation interventions. Two lessons can be learned from this at once:

LL-4a Integrate the exploitation of non-specific therapeutic factors, seen from the client's point of view, into the facilitation approach (instead of regarding them as a welcome by-product).

LL-4b Integrate the exploitation of the non-specific therapeutic factors, seen from the practitioner's point of view, into the facilitation approach.

3.1.3. Principles found through structured networking

During many years of collaboration with thought leaders and experts in the fields of psychotherapy, cybernetics, epistemology, hypnotherapy, systems thinking, linguistics, swarm intelligence, and, of course, solution-focused practice, Cauffman as a researcher had the opportunity to spend countless hours co-teaching, learning from, studying, and discussing with those experts. These contacts broadened, contradicted,

tested, challenged, confirmed or falsified (in whole or in part), and at least sharpened the views of the participating researcher and co-author of this article. From that groundwork, five Best and Bad Practices for the envisioned SoFAP-P design were distilled. Two of them are presented here.

From Cauffman's collaboration with De Shazer and Berg, he learned that in their practice of the solution-focused approach, it was custom to only implicitly talk about client goals. Although the entire approach was solution- and future-oriented, there was no room to ask a client directly for what he wanted. Precisely this however has turned out to be an extremely useful technique that practitioners now frequently use:

BP-1 Set goals in an active manner

It is necessary to actively ask questions to help the client set his goals and to help him translate them into a list of useful objectives that can serve as a checklist. Useful goals furthermore are practical, realistic, achievable, can be phrased in behavioral terms (*What will you do different if ...*) and preferably go from small to large.

This leads to another best practice:

BP-2 Set goals in a continuous manner

In psychological facilitation the client is helped to translate his goals into challenges. Once a partial goal is achieved, this change becomes the context for a follow-up challenge until the *mother of all goals* is reached: the client is helped to help himself reach his own goals by using his own resources. In brief, goal setting is not a fixed-state intervention (you once set a goal and that is it) but an active, iterative and recursive process.

3.2. SoFAP-P propositions (CIMOs)

For the case study, 25 cases were collected from which 21 CIMOs could be extracted. This extraction process was conducted by both researchers/authors separately and independently. Any differences in their outcomes were amply discussed. Whenever consensus could not be reached, the case was presented to a third party working in the field of applied psychology.

Most CIMOs are based on multiple indications that occur in several cases.

Here is (part of) one of the 25 cases analyzed to illustrate the 'mining' of CIMOs. The title of a CIMO is generally derived from the intervention contained in it and therefore has the character of an imperative: they tell the practitioner what to do.

3.2.1. Case: *It is not me. It is him!*

The HR manager gets an urgent phone call from one of the production managers who says: 'Look, can you do me a favor? I have this guy Eric in my team who is driving me crazy. I feel that he is constantly trying to undermine my authority within the team. We have just had a big fight and I told him to go and talk to you to get himself straightened out. I also told him that this was his last chance. If he doesn't stop his subversive behavior right now, I will kick him out. Can you talk to the guy right now, please? He is on his way to your office.'

HR manager: 'Is this guy good at his job? Do you really want to get rid of him or, apart from regularly getting on your nerves, is he a doing useful work in your team?' [cimo-7] [cimo-16]

Production manager (taken aback a little by this question): 'Well, he is very good at his job. The best there is. The problem is that he knows it, and he feels protected by it. But this time I mean it — get him to shape up or I will ship him out.'

HR manager: 'Well, that is a very determined, or should I say, black-white position you take. No promises from me but I will talk to him and see what can be done.'

Eric storms into the office of the HR manager: 'I must come and see you because my boss told me to. He accuses me of undermining his authority within the team behind his back. But that's a lie. It's simply not true. He got so angry that he ordered me to come and see you or he would kick me out. I know, when he is under stress, he has a tendency to think digital, black-white. He is an engineer. But now, I think the guy has just lost his marbles. That's it, I have nothing more to say — it should be him who needs the shrink.' [cimo-6]

HR manager: 'Whoa! Have a seat and let's see what can be done. Tell me what happened, please.'

Eric tells a long and winding story that can be summarized as an avalanche of mutual misunderstandings. [cimo-1] [cimo-3]

After a while, the HR manager says: 'OK, Eric, I see your point. I don't feel like getting into all kinds of rationalizations about who is right and who is wrong. You're only talking to me because you must. And it is my job to talk to you. It is obvious that your boss is upset with you. But, if you look at the positive side of this: he sends you to come and talk to me, which means that he still sees a chance to get out of this mess. Otherwise, he would not make the effort of referring you to me. So, maybe it is helpful to step over the black or white position and try to look at the situation in a more relativistic way. [cimo-17] Eric looks surprised and nods: Yes, you are probably correct. The HR manager continues: Now, let me ask you a question. What do *you* need to do differently to get your boss off your back?' [cimo-5] [cimo-7]

It is clear that Eric has no request for help whatsoever on the topic that his boss rises, i.e. his presumed subversive behavior. The HR manager decides not to delve into a fruitless search and analysis for truth: is Eric acting subversively, yes or no? Such an intervention would lead nowhere except towards more trouble. The HR manager points out that the boss, even though he is cross with Eric, still has a positive reason for his referral. [cimo-8] This has a soothing effect. The HR manager's last question then helps Eric to think about an alternative problem — what does Eric need to do differently so that he no longer has the boss on his back? [cimo-6] Now that is a problem for which Eric might have a request for help. From that point, a useful conversation takes develops. The HR manager can ask differentiating questions: 'If right now is the very worst situation of the last months, can you give me some examples of moments when it was a little bit easier to deal with each other? What did you do differently and what did your boss do differently? Follow-up questions help Eric to slowly step out of the digital position (yes/no, black/white/on/off) and start talking about what he could do differently to make his dealings with his boss easier. At the end of the conversation, the HR manager asks Eric if this conversation was useful to him. [cimo-16]. Eric responds: 'Yes, you help me see things in a more correct perspective and that is both a relief and a good starting point for the next steps forward.'

We will only present CIMO-16 and CIMO-17 here as examples.

3.2.2. CIMO-16: Ask the usefulness question

Whenever the practitioner has the impression that his facilitation is not resulting in sufficient progress or that additional feedback can be helpful, he should ask the client the following question: *Is it useful when we talk like this?* This intervention is as powerful as it is elegant and serves to invite the client to view the working relationship from a meta-perspective. The question simply elicits useful feedback from the client while answering does not require specific intellectual capacities. In this sense the question can even be used in conversations with children or people with a mental disability. The goal of this question is to offer the

client the chance to give feedback on his own facilitation process which puts him in the center of the alliance.

3.2.3. CIMO-17: Offer a relativistic perspective

When clients have the impression that they are in deep trouble, they often tend to think in black & white terms, which petrifies their vision. Then the practitioner must help them find nuances to counteract this dismal viewpoint. Giving rational counterarguments rarely yields results. To elicit the desired perspective, ask questions or make comments that suggest a more relative perspective. Examples include questions or comments such as: *Wouldn't it be good to sleep on this? Are you sure you're not exaggerating? The soup is never eaten as hot as it comes out of the bowl. Tomorrow is another day.* And so on. One must, of course, be careful to phrase these remarks respectfully and avoid the possibility that they could be interpreted as cynical, trivial or demeaning.

3.2.3.1. Limitation regarding the CIMO-logic. In 'mining' CIMOs from practitioners' cases, it was decided to focus on making explicit the *experiences* practitioners have encountered in their interactions with clients. This is done to reduce complexity in the description of the CIMOs. The consequence is that in most cases the Context, the Intervention and the expected result (the Output) are more clearly expressed in the wording of the CIMO than the Mechanism.

4. A protocol for solution-focused applied psychology

With the design propositions and principles collected as illustrated in the previous section SoFAP-P was designed as an arrangement of interventions to be applied by professionals in solution-focused psychology. The protocol does not follow simply as a logical consequence from the said principles and propositions, but rather is the result of an informed creative leap that was subjected to multiple iterative rounds of testing (more on testing in [subsection 5.2](#)).

SoFAP-P is designed to guide the conversation between practitioner and client (spanning the length of the facilitation process) and has the overarching structure of a flowchart, consisting of three major Movements.³ Each movement has several components and the often consecutive, iterative and sometimes recursive paths through these movements and components are chosen by the practitioner with the sole criterion to facilitate positive change for the client. The path through the flowchart should be determined by what happens in the working relationship between the practitioner and the client (system).

SoFAP-P ultimately constituted a 5000-word protocol and is represented by the flowchart in [Fig. 1](#).

5. Discussion

Organization science has greatly benefited from the contingency theory as formulated by Jay Galbraith (1973). The theory is based on two assumptions: first that there is no one best way to organize, and second that not all ways of organization are equally effective. Regarding the design objective from this paper, those assumptions translate as:

1. There is no best applied psychology approach
2. Not every applied psychology approach is equally effective.

Assumption 2 implies that any meaningful discussion of any such approach must be comparative in nature, whereas the first assumption implies that any such comparison must be particular, i.e. based on the experience of practitioners who feel qualified to make a judgement. This might indicate that the DSR-methodology does well to rely heavily on α -

³ The term *movement* is used here to suggest that the concepts described are like a musical movement: fluid rather than static, ever-changing yet essentially the same, elusive yet well-defined, like reality.

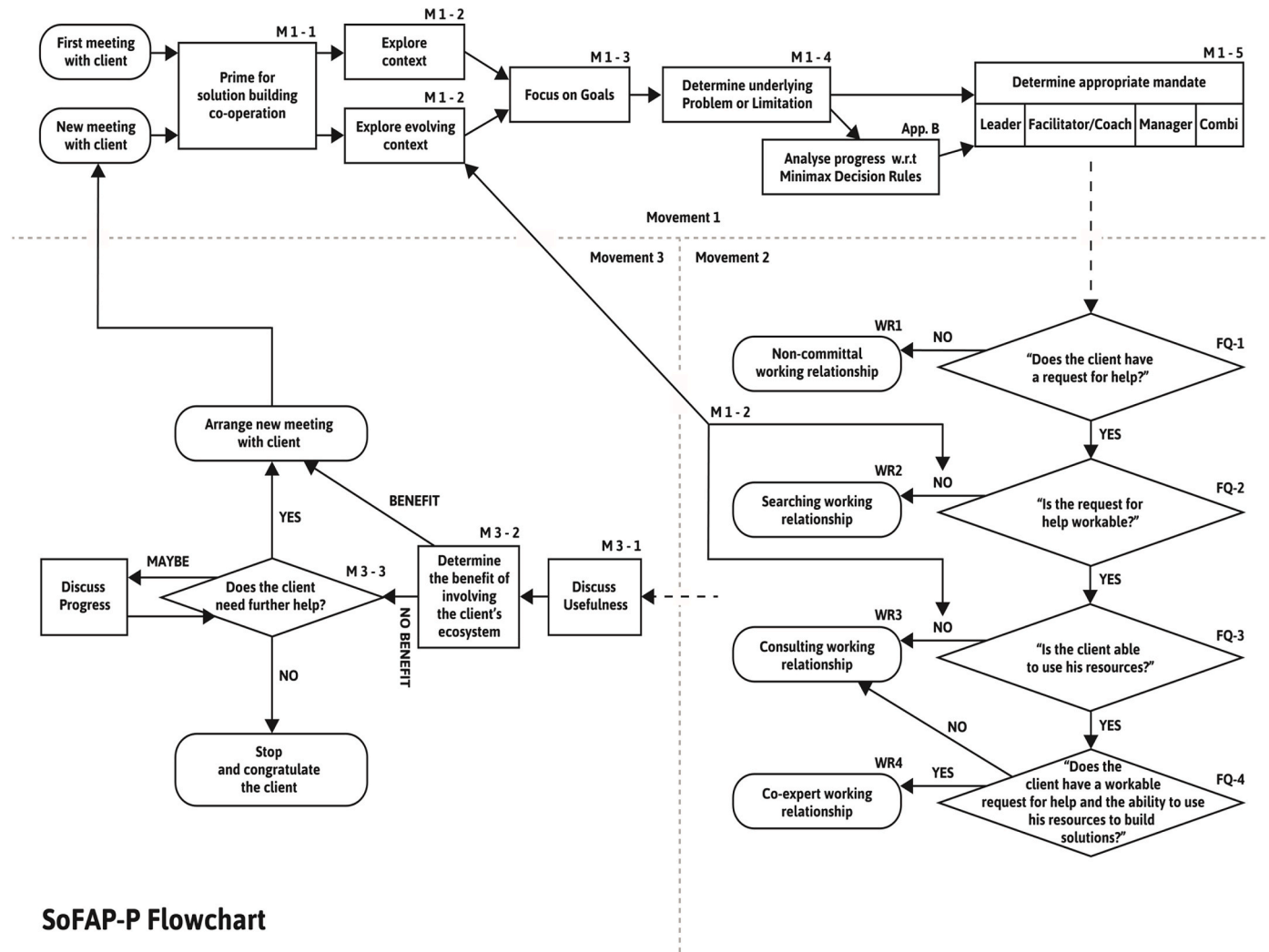


Fig. 1. SoFAP-P Flowchart; a representation of the envisioned design.

and β -testing. Indeed, in this discussion it is argued that other means of validation are inherently unrealistic.

5.1. DSR in perspective of other validation methods

The health industry has benefited a great deal from the development of evidence-based medicine (EBM), making the quality of interventions measurable, verifiable and replicable using scientific research criteria derived from the natural sciences. This evolution was of historical importance because it was a step forward from judging care based on personal beliefs, experience and professional reputation. EBM expanded into many other areas of application, and it is the question to what extend it can be pursued in applied psychology.

For example, many design principles and propositions from section 3.1 and 3.2 can be validated through quantitative data, but it is clear that the protocol from section 4 is too unspecific to be subjected as a whole to any kind of quantitative test. This article illustrates that DSR is flexible enough to offer such a multi-faceted validation using a mixture of quantitative and qualitative methods.

Speaking beyond the case study, DSR offers a realistic scientific methodology through which psychological interventions can be validated in the field of applied psychology. It manages to do so because it only aims to bring about positive change, to improve, and does not seek to explain why this improvement occurred. Conversely, the tradition of recording client cases from practice makes the field of client-oriented

psychology ideally suited for the application of DSR: the abundance of case material facilitates the extraction of potential design propositions and allows for any design principle to be sufficiently tested.

5.2. Case: validating SoFAP-P

As stated in subsection 2.3., as SoFAP-P was being created, it was subjected to α - and β -testing. The results of those tests are discussed here. The β -test will make clear that SoFAP-P is indeed effective (i.e. that the design objective has been met) while the α -test shows that practitioners value the principles and propositions that lie at its base.

5.2.1. A survey on the principles and propositions underlying SoFAP-P

In order to validate the SoFAP-P design at the α -test level, in April and May 2022 an on-line opinion poll was released regarding the building blocks of the SoFAP-P design: *Points of Attention*, *Lessons Learned*, *Best & Bad Practices* and *CIMOs*. The survey was conducted among practitioners and scientists who have both knowledge or experience related to problem-focused as well as solution-focused psychology. Respondents came from the network of both authors and were invited by them personally or through Louis Cauffman's newsletter for practitioners who took part in his training courses, master classes or seminars over the past decades.

The survey contained 81 multiple choice questions of which 75 were about the building blocks and 6 about the presumed productivity of the

solution-focused approach. In the case of the building blocks, participants were asked to rate their relevance on a 5-point Likert scale. Here, relevance was considered an implicit indicator of the pragmatic validity of the building block.

The main conclusion of the survey was that the relevance of each building block on average scored higher than 3.00 on the Likert scale, with 70 scoring a relevance higher than 3.50. What's more, the standard deviation on almost all questions was low, indicating a strong consensus on the relevance c. q. pragmatic validity of most building blocks.

5.2.2. Applying SoFAP-P to real-life cases

For the β -test, four cases from literature on solution-focused psychology were chosen, all four of them meeting the criterion that the interventions of the practitioner had proved productive. It was verified that the conversations that took place during sessions indeed followed the guidance of SoFAP-P. For each case the sequence of interventions could be marked with a red line on the SoFAP-P flowchart (see Fig. 1). In other words, the course of the facilitation process would have remained unchanged if the practitioner had based his interventions on SoFAP-P. The fact that this could be done at all in each of the four test cases yields a positively valued β -test result.

It would be interesting to extend the β -test to a field test with trained practitioners. If such a test were successful, it would add even more to the validity of SoFAP-P.

5.3. Conclusion

We have shown how an effective but not generally recognized approach in applied psychology can find scientific grounding through the application of DSR. This process always leads to the formulation of a design, which might, as the particular case of the solution-focused approach has shown, take the form of a protocol. A protocol that constitutes a novel articulation of the approach studied that allows to be subjected to α - and β -testing. One might ask if such a design must always follow the structure of a flowchart as represented in Fig. 1. However, this is not the case. As stated in the introduction DSR strives for the 'production of prescriptive knowledge' which leaves room for any thinkable arrangement of interventions such as a decision-tree, a manual, a behavioral code, etc. In all cases the design remains in alignment with Simon (1969) definition of an artifact: 'a meeting point -an 'interface' in today's terms-between an 'inner' environment, the substance and organization of the artifact in itself, and an 'outer' environment, the surroundings in which it operates.'

Furthermore, the application of DSR in applied psychology might be wider than is illustrated here. The case of the solution-focused approach revolved around a way of working that has existed for decades. And only under such circumstances would it make sense to consider the lack of validation as a field problem for practitioners. However, it is likely that DSR can also lead to designs that contribute to well-established (or even completely new) approaches in applied psychology.

DSR is ultimately not concerned with finding the best approach. Rather it seeks to support practitioners in their daily work by improving what they already do. In this way it directly offers what descriptive or exploratory research can only allude to in the long term. Given the promising findings from current research demonstrating how DSR can

be used to construct and validate a solution-focused approach, we can wholeheartedly recommend its broader use to professionals in the field of applied psychology.

CRediT authorship contribution statement

Mathieu Weggeman: Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Louis Cauffman:** Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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