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Needs-Based Assessment of Twice-Exceptional Gifted Students: The S&W-Heuristic

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ABSTRACT

Misdiagnoses and missed diagnoses of gifted students with co-occurring learning-, developmental and behavioural disorders are often mentioned in literature and practice. Consequently, these Twice-Exceptional (2E) students often fall between two stools regarding appropriate psycho-educational interventions. This article offers a research and practice informed assessment procedure, namely the Strengths and Weaknesses Heuristic (S&W-Heuristic), that can help to tackle such problems in case giftedness or any 2E is suspected. This S&W-Heuristic was developed via the method of design research. Initially the S&W-Heuristic was developed to assess students with (suspicion of) the co-occurrence of intellectual giftedness (IG) and autism in a needs-based way, though, subsequently to assess (potential) 2E-students in general. The systematicity of the S&W-Heuristic may help psychologists and special remedial educationalists to reveal hitherto camouflaged strengths or weaknesses in underachieving smart students and to understand their ambivalent psycho-educational needs. Being the product of design research, this article also offers a prelude to new theoretical perspectives regarding the concepts IG and 2E. By shifting from a 'classification-based' to a dynamic 'dimensional-based' definition of 2E, camouflaged talent will be recognised more effectively and will get more opportunity to flourish. Accordingly, it is proposed to consider IG and 2E as constructs on a continuum.

Keywords: intellectually gifted, twice exceptional, needs-based assessment, adhd, autism, dyslexia, dyscalculia

INTRODUCTION

Twice-Exceptionality (2E) is a rather new phenomenon in the international educational and psychological gifted literature. Since about the late 1990s, publications about the co-occurrence of giftedness and learning disabilities appeared (e.g. Brody & Mills, 1997), and about the year 2000 the first publications on giftedness in combination with developmental disorders came up (e.g. Antshel et al., 2007; Burger-Veltmeijer, 2008; Neihart, 2000; Webb et al., 2005). Only over the past decade, a few systematic literature reviews have been published on (parts) of 2E addressing cognitive and/or non-cognitive aspects of the co-occurrence of (intellectual) giftedness and autism spectrum disorder, ADHD, or specific learning disorders (Beckmann & Minnaert, 2018; Burger-Veltmeijer, Kroesbergen, Hoogeveen & Minnaert, 2019, 2020; Burger-

Veltmeijer, Minnaert & Van Houten-Van den Bosch, 2011; Foley-Nicpon, Allmon, Sieck, & Stinson, 2011; Gelbar, Cascio, Madaus, & Reis, 2021; Lovett & Sparks, 2013; Martin, Burns, & Schonlau, 2010; Rommelse et al., 2016).

Identification in International Literature

The international literature showed a wide variety of descriptions of 2E. Most definitions include that 2E-students have the potential of exceptional ability on the one hand and demonstrate learning- and/or developmental disabilities on the other hand. In addition, some behaviours of gifted children can appear similar to behaviours of disabilities and it is usually stated that both exceptionalities may mutually camouflage, distort or neutralise one another, so that either the abilities or the disabilities or both are hidden (e.g. Baldwin, Baum, Pereles, & Hughes, 2015; Reis, Baum, & Burke, 2014; Webb et al., 2016). This is called the camouflaging effect. 2E-students are often identified late (Amend & Peters, 2015; Hughes, 2011) and show more complex socio-emotional development and problematic behaviours than (highly) gifted students without 2E (Beckmann & Minnaert, 2018; Foley-Nicpon, 2016; Hughes, 2011).

Appropriate guidelines for identification and provisions are, however, not yet well established for 2E (Prior, 2013). Misdiagnoses and missed diagnoses of gifted students with co-occurring learning-, developmental and behavioural disorders are often mentioned in international literature and in psycho-educational practice (Burger-Veltmeijer, 2016; Pfeiffer, 2015; Prior, 2013; Webb et al., 2016). Consequently, these 2E-students often fall between two stools when it comes to appropriate psycho-educational interventions and tailored arrangements (Burger-Veltmeijer, 2020). Even if 2E-students are identified in an unbiased way, it might be difficult to tune appropriately to their complex psycho-educational needs (Hughes, 2011; Trail, 2011).

This may increase the chance of internalising and externalising behavioural problems as it may increase the likelihood of frustration of (latent) talent (Burger-Veltmeijer & Minnaert, 2017). The latter is too bad, not only for a student's own development, but also for society, because of the loss of high potential and unlocked learning opportunities.

Identification in Psycho-Educational Practice in the Netherlands

Since the act for 'Befitting Education' (in Dutch: 'Passend Onderwijs') in 2014 came into effect, the focus on giftedness and talent development has grown strongly in the Netherlands. Not only in education, but gradually in youth mental health care as well. Professionals, parents, and psycho-educational organisations became even more interested in giftedness after the onset of the government funding for gifted students in 2019 (Burger-Veltmeijer, 2020; Minnaert, 2022). This is a good thing, because gifted and highly intelligent students need to be sufficiently challenged at the level of their zone of proximal development, to be able to really 'learn how to learn' and to optimally develop their talents.

In clinical and educational practice, however, we experience a detrimental side effect of the current 'hype', viz that learning and social-emotional problems in smart children increasingly are one-sidedly interpreted by professionals and parents as characteristics of giftedness. For example, if a student has problems getting along with other children or has a strong fear of failure, and at the same time shows signs of high intelligence, then often the child is referred by the school and/or the parents to a school- or youth-care psychologist with the question whether this child is (highly) gifted, and the request to administer an intelligence test.

We experience that rather often such initial questions are being followed up literally by psychologists in education as well as youth mental health care (Burger-Veltmeijer, 2020, 2021).

If, subsequently, the IQ turns out to be very high, then the social-emotional problems are rather often attributed to giftedness, by (school)psychologists or other professionals, whilst counterhypotheses were not assessed. This is not in line with the current empirical findings that intellectual giftedness cannot be regarded as a cause of problems at all. High intelligence is not a risk factor, but rather a slightly protective factor with regard to social-emotional and learning problems (Alabbasi, Ayoub, & Ziegler, 2021; Rommelse et al., 2016; Verschueren, Lavrijsen, Weyns, Ramos, & De Fraine, 2019). Such an approach, in favour of the strength of high intelligence, may lead to one-sided and insufficiently coordinated psycho-educational interventions (Burger-Veltmeijer, Minnaert, & van den Bosch, 2015).

Conversely, it is also biased and disastrous if a 2E-student's identification and treatment are one-sidedly based on the weak developmental characteristics, and the strong capacities and talents are not recognised or even ignored. This is often emphasised in giftedness literature (e.g., Webb et al., 2005, 2016). The bias that students are unilaterally recognised for their strengths, however, seems to be a rather new phenomenon in giftedness literature. Only a few authors explicitly warn against the impeding effect of particularly this unilateral vision on the mental wellbeing and healthy development of individual 2E-students (Amend & Peters, 2015; Burger-Veltmeijer, Minnaert, & Van den Bosch, 2015, 2016; Rommelse & Slaats-Willemse, 2020).

Eventually, in either direction the tolerance for asynchrony is very important. This may be inferred for instance from the publication of King (2022), who recounted his own and others' experiences as a 2E-student and illustrated that neither special education nor gifted education meet the ambivalent needs of this target group, due to issues with identification and service provision.

AIM

Up to now, there are no evidence-based methods available regarding diagnostics and assessments of (potential) twice-exceptional students, as these subjects have never been thoroughly or rigorously empirically researched. This is related to the lack of an unambiguous definition among and between the various 2E labels. Meanwhile, in education and mental health care, psychologists and remedial educationalists experience a growing need for clear guidelines. For the benefit of psychologists and special remedial educationalists and other professionals in psycho-educational practice, it is necessary to fill this gap with a theory-based method that can be used in psychoeducational practice. It should assist professionals to shape individual assessments and interventions more appropriately in case of suspicion of any 2E and in case differentiation between features of IG and 2E is aimed for.

METHOD

Design research is suitable for the aforementioned purpose, because it serves both theory development as well as practical applications at the same time. Educational design research can be characterised as an iterative cyclic approach of developmental research. The developed design is explorative in nature and (at least partly) based upon theoretical propositions (Nieveen, McKenney, & Van den Akker, 2006; Van den Akker, Gravemeijer, McKenney, &

Nieveen, 2006; Walker, 2006). The design research method used in this article comprises a combination of scientifically grounded and practice-based advanced insights which were continuously elaborated in a cyclic process. Various phases can be discerned.

Phase 1
The factual state of the art in international research regarding identification, assessments, and interventions of 2E. A comprehensive systematic literature review was used for this purpose (Burger-Veltmeijer et al., 2019).

Phase 2
Development of a needs-based assessment method for (potential) 2E-students. The S&W-Heuristic was chosen, though originally designed for the needs-based assessments of students with (suspicion of) IG in co-occurrence with autism (Burger-Veltmeijer, Minnaert, & van den Bosch, 2014). It was substantiated by means of a systematic literature review (Burger-Veltmeijer et al., 2011). Subsequently, two validation studies had been performed (Burger-Veltmeijer, Minnaert, & van den Bosch, 2015, 2016). Since then, the S&W-Heuristic has been disseminated through post-master courses for psychologists and special remedial educationalists in clinical and/or educational practice. It has been continuously further developed for the purpose of needs-based assessments of twice-exceptional students in general, based on practical experience, continuous feedback from the users, and advanced theoretical insights (Burger-Veltmeijer, 2020; Burger-Veltmeijer, 2016, pp.158-159; Burger-Veltmeijer & Minnaert, 2016).

Phase 3
Case description that provides practical insight into the latest principles of the S&W-Heuristic. This case description was partially borrowed from a Dutch publication with permission of the author and the collaborator (Burger-Veltmeijer, 2020).

Phase 4
Evaluation by means of a questionnaire among 37 participants, school- and mental health psychologists and special educationalists, who had just taken a post-master course regarding the latest version of the S&W-Heuristic in 2022, and who submitted a case description in accordance with the principles of the S&W-Heuristic. The following questions were asked: “What value do you assign tot the principles of the S&W-Heuristic?”, “To what extent have the principles of the S&W-Heuristic changed / strengthened your understanding?” and “To what extent can you apply the principles of the S&W-Heuristic in practice?”. The answers to these three questions could be given on a 5-point Likert Scale (5 = very good / very much, 4 = good / much, 3 = sufficient, 2 = unsatisfactory, 1 = badly). This was followed by the open-ended question: “What was an eye opener for you?”. All of these questions were part of the evaluation form of the post-master course. In addition, the trainer of the post-master courses of the S&W-Heuristic was asked what struck the most about the way in which post-master students conducted their case studies.

Phase 5
Prelude to new theoretical perspectives regarding the concepts IG and 2E.

RESULTS

Results Phase 1: Theoretical Facts on Identification and Assessment of 2E

Based on the systematic literature review of Burger-Veltmeijer et al. (2019, 2020) the following main conclusions could be drawn.

The identification and inclusion criteria for 2E-samples proved to be very diverse in the empirical research. Large differences within and between intelligence levels, learning results, neuropsychological and non-cognitive characteristics were found in the samples of 2E-students. This accentuates that the concept 2E is not clearly defined.

Moreover, scientists disagreed on the classifying criteria used for diagnosing individual students with any 2E: Some authors advocated the interpersonal criterion or normative approach, which means there must be an absolute weakness compared to the levels of functioning of the average of peers. Others emphasised the intrapersonal criterion, meaning that there must be a substantial discrepancy between the strengths and weaknesses within the same person. This is the case, for example, if a student with an IQ of 130 functions at a group average level for reading and spelling.

Furthermore, in the literature on giftedness and 2E it is often mentioned that talents and weaknesses can compensate, camouflage, or distort each other, which can lead to mis- or missed diagnoses in 2E-students. However, the current empirical literature shows unambiguously neither confirming nor negative evidence for this so-called camouflaging effect in 2E.

And finally, little is written about needs-based assessment procedures in (potential) 2E-students, and no effect studies have been done regarding treatment or guidance of 2E-students. However, the following tendencies can be discerned: an individual approach is always necessary and assessment of strengths as well as weaknesses are particularly important for this target group.

It was concluded that all of this emphasises the importance of an assessment model of 2E in which the various relevant components of the areas of abilities and problems of individual (supposed) IG- or 2E-students can be investigated. There must be room for recognising absolute as well as relative weaknesses, but relative intrapersonal discrepancies should not 'automatically' lead to a classifying diagnosis, a label 2E (such as IG+ASD or IG+Dyslexia). Rather, such discrepancies should be seen as a starting point for adequate psycho-educational interventions.

A model that seems to most closely approximate this is the Strength & Weakness Heuristic (S&W-Heuristic) (Burger-Veltmeijer & Minnaert, 2016; Burger-Veltmeijer, Minnaert, & van den Bosch, 2014) because it captures aspects of the aforementioned 'intra-individual discrepancy' as well as the 'interpersonal normative' criteria.

Moreover, it is in line with the call in current literature for comprehensive assessments in case of potential 2E-students (Amend, 2018; Assouline, Foley-Nicpon, & Whiteman, 2010; Berninger & Abbott, 2013; Foley-Nicpon et al., 2011; Ottone-Cross et al., 2017).

Results Phase 2: The Strengths and Weaknesses Heuristic (S&W-Heuristic)

Next, the fundaments, schematic system, and assessment procedure of the S&W-Heuristic are explained. Some technical terms are defined in box 1. Box 2 elaborates on the systematicity of the search of (neuro)cognitive versus emotional causes of the learning and behavioural problems that (supposed) IG- or 2E-students may encounter.

Fundaments:

The S&W-Heuristic is not primarily aimed at classificational diagnoses, such as IG or any 2E. Instead, the S&W-Heuristic is a rule of thumb that enables and optimises needs-based assessment procedures. It helps to make a profile of absolute as well as relative S&Ws along the lines of various individually relevant developmental dimensions. This occurs by means of comprehensive assessments, in which the psychologist may utilise 'quantitative' tools such as (neuro)psychological and didactic tests as well as 'qualitative' or 'descriptive' tools such as observations, interviews, questionnaires, and dynamic assessment.

The method of the S&W-Heuristic is based on three pillars: (1) reduction of confirmation bias in the assessment process, meaning diminishing the likelihood of one-sided assessments directed to either giftedness and talents or disabilities and deficits; (2) stimulation and improvement of systematicity in assessments, along the lines of the relevant (neuro)cognitive and non-cognitive dimensions, from intake stage all the way to evaluation stage; (3) promotion of creatively constructed interventions that simultaneously merge strengths-based as well as weaknesses-based needs, so that the development of individual students is addressed in a balanced and unbiased way. These interventions need to be tailored to the specific individual educational and home situation.

Scheme:

Figure 1 is a schematic representation of the dimensional assessment that takes place in the S&W-Heuristic. It is a condensed version of the current layout. The assessment stages are placed horizontally, from the intake until the evaluation stage. Cognitive and non-cognitive dimensions are placed vertically. In case of (supposed) IG- or 2E-students with possible camouflaged traits, the first focus of the assessment is on the (neuro)cognitive dimensions above the red line. These are intelligence (indexes), aspects of social reciprocal interaction and communication (social intelligence or theory of mind), motor skills, school subjects, executive functions, and central coherence. So, above the red line, are the central underlying (neuro)cognitive dimensions of which one or more often play an underlying role in learning as well as behavioural problems with which (presumed) 2E-students usually are referred for psychoeducational help. (Neuro)cognitive weaknesses influence the extent to as well as the form in which behaviour and emotions reveal, such as tantrums or fear of failure (Prins & Van der Oord, 2008; Swaab, Bouma, Hendriksen, & König, 2016). Relative or absolute (neuro)cognitive weaknesses might be camouflaged, though, in IG- or 2E-students. They show up as behavioural and/or emotional problems. Consequently, the first important assessment question in the S&W-Heuristic concerns the developmental levels of these (neuro)cognitive dimensions. Therefore, these are visually separated from the behavioural and emotional dimensions, which are situated beneath the red line. This is further elaborated in box 2.

Other non-cognitive dimensions that might likewise be important to be challenged or to be used to remediate the weaknesses can be added below the red line. Examples are motivation, hyper-sensitivity, or specific interests or even obsessions of the student. Since the S&W-Heuristic is dynamic in nature, these can be chosen by the psychologist himself.

Box 1: Glossary

Relative either refers to weaknesses in relation to a student's own strengths, or strengths regarding one's own weaknesses. Absolute means that a certain level op development is significantly above or below the average of a norm group, that is age group, in case of intelligence or executive functions, or year group, in case of the level of school subjects. Dimension refers to a (theoretical) line on which the quantitative and qualitative values of a (neuro)cognitive or non-cognitive developmental characteristic can be indicated. For example, the baseline of the normal distribution of IQs, which can vary from 40 to160 in case of the Dutch version of the WISC-V (WISC-V-NL). For quantitative values which are normally distributed, a dimension is subdivided into standard deviations. For example, the S+ column (Figure 1) indicates that a child scores one standard deviation above average (≥ 1sd). This concerns IQs ranging from 115-130. Column S++ (≥ 2 sd) covers IQs 130-145. Another example of a dimension is the school subject 'word reading'. Here, too, the level of an individual child is somewhere on a line that ranges from 'very weak' to 'very strong'. If a dimension is wholly or partly filled in via qualitative assessment tools, then it is not possible to subdivide into standard deviations. In that case, the psychologist should subdivide into qualitative categories such as (high or low) average and above or below average. Obviously, experience with the target group is a prerequisite for such qualitative notations. To avoid sham exactness, qualitative data should be spread per dimension over two columns in the table of the S&W-Heuristic. Most didactic, cognitive and (neuro)psychological characteristics have such lines, which we call dimensions. If we should put these lines below each other, a profile of individual (relatively or absolute) strong and weak developmental levels appears.

Central coherence: Low central coherence means a strong focus on details, and trouble perceiving the whole picture in visual, auditory, or social contexts. In other words, the student suffers from fragmented learning and cannot see the forest for the trees.

Neurocognitive: Neurocognitive functions refer to possibilities for information processing and control of behaviour. Domains are for instance attention regulation, motor functions, executive functions.

Assessment Procedure:

In the intake-stage, the psychologist inquires the problems as experienced by the student and his parents/teachers. Subsequently, in the strategy-stage, the psychologist translates this information into assessment questions, and determines which dimensions are relevant in this individual case (Burger-Veltmeijer, Minnaert & van den Bosch, 2014; Pameijer & van Beukering, 2015). Subsequently, appropriate quantitative and qualitative assessment tools are to be selected.

In the investigation stage, the quantitative and qualitative assessment data are plotted in the table. The profile might reveal relative and absolute S&Ws. Then, in the indication stage, each separate W as well as each separate S is linearly translated to appropriate psycho-educational

needs (SPENs). This intermediate step reduces the chance that the psychologist will overlook a certain S or W. The psychologist may use help questions such as: “What does this child need to stimulate and challenge this strength?", and “what does this child need to stretch, stimulate or remediate this weakness?”.

Strengths & Weaknesses Heuristic (S&W-Heuristic), condensed version *© Burger-Veltmeijer & Minnaert, 2022*

Intake stage	**TRANSLATE** *Strategy stage*			**Profile of relative Strengths & Weakness** *Investigation stage*						**TRANSLATE**	**Needs-based info**				
											Indication stage			*Advice stage*	*Evaluation stage*
	Assess-ment quest-ions	**Dimensions** choose relevant (sub)dimensions (below are examples); ad and remove rows	**tools**	**W - - (very) low (≤ -2 sd)**	**W - below average (≤ -1 sd)**	**S/W +/- average**		**S + above average (≥ 1sd)**	**S ++ high (≥ 2sd)**	**S +++ very high (≥ 3sd)**		**Special Psycho-Educational Needs: SPENs**	**Current approach school, peers, parents**	**Goodness of fit?**	**Integra-tion of Interven-tions**	**evaluate interven-tions ± every 8 weeks**
INTELLI-GENCE		e.g. WISC-V FSIQ, GAI													
		Relevant Index scales													
		Creative intelligence													
SOCIAL Communication & interaction, ToM / social intelligence		Reciprocity: verbal, social													
		Self-insight													
		Adjustment others / context													
		……													
MOTOR		……													
SCHOOL-SUBJECTS		……													
		……													
EXECUTIVE FUNTIONS / SKILLS		Attention regulation													
		Working memory													
		Cognitive flexibility													
		Inhibition													
		……..													
CENTRAL COHERENCE		Visual / auditive (verbal)													
		Social													
NON-COGNITIVE DIMENSIONS **Restrict the amount of subdimensions, choose relevant ones**		Interest/passion/obsession													
		Motivation													
		Hyper-sensitivity													
		Externalising behaviour													
		Internalising behaviour													
		Emotions													
		Self-image													

Figure 1: S&W-Heuristic

Abbreviations Figure 1: FSIQ, Full Scale Intelligence Quotient; GAI, General Ability Index; S, Strengths; sd, standard deviation; ToM, Theory of Mind; W, Weaknesses; WISC-V, Wechsler Intelligence Scale for Children 5th edition.

In the column 'current adjustments', the diagnostician examines per relevant S and W which interventions have been performed up to now in education, upbringing, or therapeutic setting. Next, he determines which of these current approaches are appropriate to the identified SPENs. In this way, the psychologist gains insight into whether or not there is already a 'goodness of fit' and he may include these suitable interventions in the eventual integrated advice. Only then, in the advice stage, all SPENs, however ambivalent they may seem, are to be translated into an integrated approach.

This is the stage in which interventions are derived from combinations of Ss and Ws, considering the child's environmental characteristics. This can be done with help-questions

such as: "how can we challenge this particular S and at the same time stimulate, compensate or remediate this particular W?" or "how can we use (match) Ss to strengthen (relative) Ws?" or "how can we prevent (relative) Ws from hindering the development of Ss?".

Box 2: (Neuro) Cognitive and Emotional Causes

In the S&W-Heuristic procedure the psychologist firstly addresses the question whether there are any relative or absolute (neuro)cognitive weaknesses that might explain or influence the behavioural, emotional, or learning problems which come forward in the intake stage. If assessment indeed reveals one or more (neuro)cognitive weaknesses, such as (relative) weak attention regulation or (relative) weak cognitive flexibility, then the psycho-educational needs are to help the child to recognise, acknowledge and deal with this, and to provide, for instance, more structured approaches in a talent-focused curriculum of a 2E-student. If no primary (neuro)cognitive cause can be identified, then it can be assumed that the cause of the problems is not (neuro)cognitive, but emotional in nature. Then evaluate after some weeks if and how the interventions influenced the emotional and behavioural issues. An example: Suppose a presumably smart student has problems starting up and continuing to do schoolwork. The cognitive profile above the red line reveals, however, no relative or absolute weaknesses in any executive functions, but underneath the red line it shows a strong negative fear of failure. This means there is no decisive reason to think of a (neuro)cognitive cause, and an emotional cause is far more likely. Then the appropriate interventions for reduction of fear of failure in gifted students can be used, for instance in combination with support regarding how to study. Moreover, further emotionally-focused assessment can be carried out if necessary or recommendable. However, if there does exist an absolute or relative cognitive weakness above the red line, this contributes to and influences the perceived fear of failure. Especially if it was hitherto camouflaged. Subsequently, it is important that through psychoeducation a realistic picture is created for the student and his parents and teachers of both the strengths as well as weaknesses. Moreover, interventions in education, upbringing and therapy should be geared to this. In this example, an 'automatic' use of fear of failure reduction training would be 'symptom alleviation' and would ignore the core problem. This example illustrates that the systematicity of the S&W-Heuristic helps to examine whether individual problems with learning or behaviour are related to a predominantly emotional or (neuro)cognitive underlying cause, so that it becomes clear which (combination of blended) interventions are appropriate. All of this without primarily aiming at a classifying diagnosis. Sometimes the causes are mixed and reinforce each other in a vicious circle. But even then, it becomes clear which ones weight the heaviest at that moment. This does require the necessary professional expertise regarding gifted and talented students, as well as regarding students with learning, behavioural and/or developmental problems.

In this advice stage, the interventions are to be constructed in such a way that they integrate strengths-needs with weaknesses-needs in a blended way. As such justice is done in a balanced

way to the individuality of the 2E-student with its' unique profile. It reduces the chance that any (until then camouflaged) strength or weakness will be neglected. Then the effect of the interventions is to be evaluated after approximately eight weeks (preferably not interrupted by holiday vacation weeks).

This procedure may reduce biased and haphazardly implemented interventions in education, in upbringing at home, or in therapeutic settings. It helps the student as well as his parents and teachers to recognise, acknowledge and eventually accept his Ss as well as his Ws. Tolerance for asynchrony, by the 2E-students themself as well as the people in the environment, is an important prerequisite to develop and keep a balanced self-image along lifetime.

Results Phase 3: Case Description, Revealing Camouflage

Figure 2 is the compressed profile of an intelligent very self-determining boy in 5th grade. His learning results do not pose any problems for the school, but the boy increasingly showed tantrums and social inacceptable, sometimes transgressive behaviour, especially at home. Until now, this has been interpreted by school and parents as forthcoming from a lack of opportunity to work autonomously on challenging assignments. Therefore, he was allowed in grade 4 to take part in the gifted program. Unfortunately, this led to more tantrums, especially if he was supposed to choose or plan tasks by himself.

Then, after a comprehensive assessment, strengths emerged in the (neuro)cognitive profile in most intelligence indices, especially in visual-spatial tasks, as well as in technical reading and spelling. At the same time, relative and absolute weaknesses showed up in the areas of creative intelligence, social reciprocity, central coherence, and reading comprehension. Moreover, through observations in the test situation as well as in his class at school, it turned out that this boy was less inclined to obstruct or misbehave if he was provided with clear instructions. Below the red line, the profile shows no negative fear of failure, but it does reveal a worryingly low level of self-esteem and problems with emotion-regulation. Moreover, the boy showed a strong passion for city-maps and was interested in urban planning in sum, we see that underneath the problems with emotion regulation there are relative (neuro)cognitive deficits, which were camouflaged by the boy's seemingly need for autonomy. His low self-esteem was also camouflaged by the behavioural problems.

After the investigation stage, the psychologist firstly explained the problems to the student, his parents, and the teacher, by means of the visual representation of the S&W-profile (see Figure 2). After this so called 'psycho-education', the psychologist advised to provide the boy with challenging assignments in the field of his interests, that is map designing and urban planning (use strength), which he should perform with an interested peer (stretch social weakness); and to support him by means of structured instructions as well as restrictions to self-determination, for instance by means of limiting the opportunity to choose his own curriculum, by allowing choices between no more than two alternatives (compensation / remediation of weakness);

and to help him to visualise his results (use visual strength) via tabular structures (bypassing weakness in central coherence). That the relatively weak overview of texts in reading comprehension was related to the weak central coherence, was also an 'eye-opener'. This uncovered that working independently on enrichment tasks was too difficult for this boy, notwithstanding his need for challenging assignments. For targeted reasons of clarity and parsimony, the integrated interventions were described briefly here. The advice was more extensive, and included coaching for emotion-regulation, practicing socially acceptable behaviour, and parental guidance.

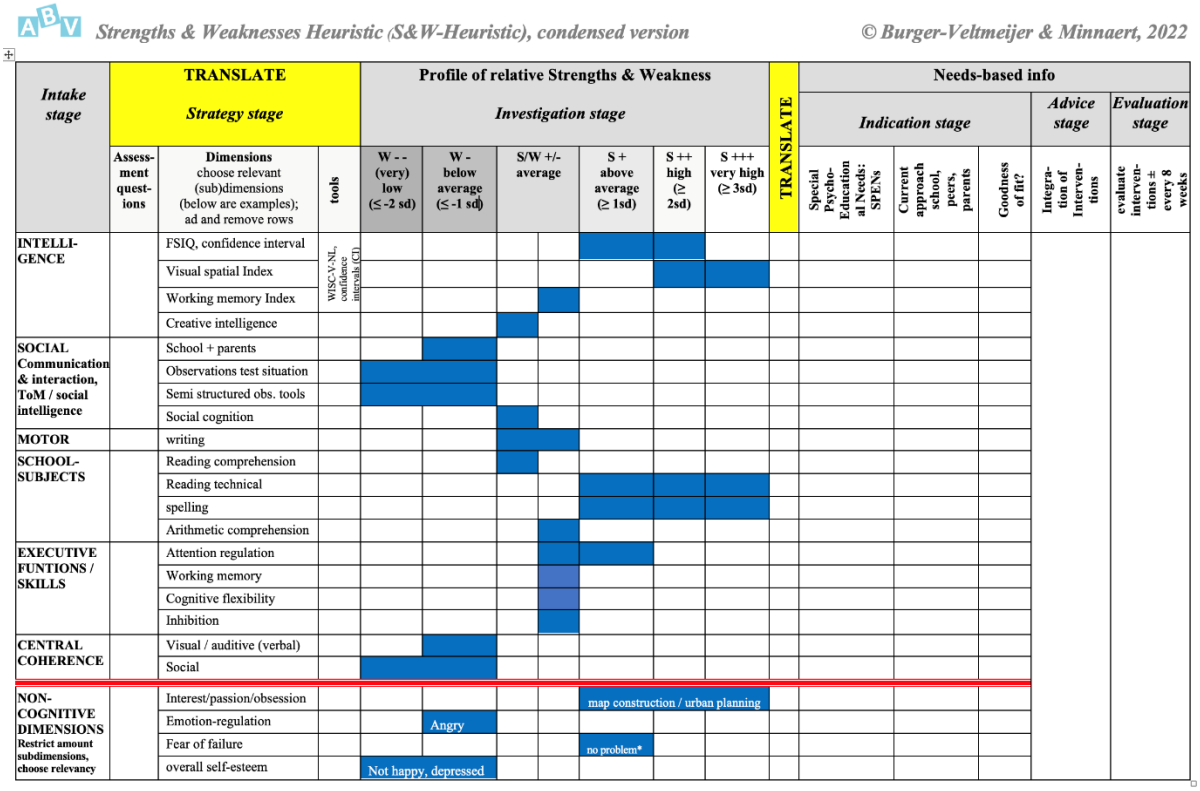

Figure 2: case example of S&W-profile

Results phase 4: Experiences with the S&W-Heuristic

Quantitative:

Table 1 shows the answers of the 37 participating psychologists and remedial educationalists to the three questions, in terms of scores on the 5-point Likert Scale.

The average score of the first question is 4.1. This means that the participating psychologists and remedial educationalists assign a good rating to the principles of the S&W-Heuristic. The average score on the second question is 3.9. This means that the principles of the S&W-Heuristics changed or strengthened the participants' understanding of needs-based assessment among (potential) 2E learners fairly strongly. Finally, question three has an average score of 3.7.

This means that the participating psychologists and remedial educationalists found the principles of the S&W-Heuristics to be more than sufficiently applicable in practice, though the score leaves room for improvement to apply the heuristic in practice.

Table 1: Evaluation among 37 participants of the S&W-Heuristic, in 2022, on a 5-point Likert Scale 5 = very good / very much, 4 = good / much,3 = sufficient, 2 = unsatisfactory, 1 = badly

Answers → Three questions ↓	5. very well, very much	4. well, much	3. suffi-ciently	2. unsatis-factory	1. badly	Total score	Total participants	Mean score
What value do you assign to the principles of the S&W-Heuristic?	11	19	6	1	0	151	37	4.1
To what extent have the principles of the S&W-Heuristic changed / strengthened your understanding?	7	20	9	1	0	144	37	3.9
To what extent can you apply the principles of the S&W-Heuristic in practice?	6	15	14	2	0	136	37	3.7
Totals across three questions	24	54	29	4	0		111	
Percentages across three questions	21.6%	48.7%	26.1%	3.6%	0%		100%	

The two bottom rows in table 1 show the totals and the percentages by Likert scale score across the total of the three questions. The score 4 (well, much) is assigned by 48.7% of the participants, and is by far the most represented. It is followed to a rather similar extent by the score 5 (very well, very much; 21.6%) and 3 (sufficiently; 26.1%). This reveals that, on average, the principles of the S&W-Heuristic are sufficiently to very well appreciated by the 37 participating psychologists and remedial educationalists.

Qualitative:

The answers to the open-end question "What was an eye-opener for you" points out that the systematic procedure helps to focus less on diagnostic labels and to tailor assessments more adequately to the individual psychoeducational needs of (potential) 2E-students. It helps as well to unveil hitherto camouflaged strengths or weaknesses and it especially visualises that relative weaknesses can have a substantial impact on the well-being of potential 2E-students, even if there is no absolute weakness or absolute deficit involved.

Furthermore, participants are specifically enthusiastic about the visual overview of the S&W-Profiles. It helps them to analyse systematically, and its purpose of psycho-education for parents, teachers, and the student himself, is an eye-opener for some participants. Some participants were specifically glad with the visual overview because it revealed possibilities of how to use strengths and talents to stretch, remediate or compensate for weaknesses.

On the other hand, some participants reported that the implementation of the S&W-Heuristic takes much time and it is necessary for professionals to take further courses before the S&W-Heuristic can be used adequately and efficaciously. Additionally, some professionals experience resistance within their work setting, since practical and financial objections stand in the way of proper implementation. The latter were advised to try to adjust their own mindset in a creative way from classificational view to a dynamic, needs-based view, as far as possible within the practical and financial limits of their work situation, for the benefit of individual students.

Experiences of Trainer:

In the post-master courses of the S&W-Heuristic, the trainer experienced that it was rather difficult for many participants, to start in the intake stage in an unbiased way. Firstly, because psychologists often accepted 'hear-say' information from parents and/or from school. Secondly, because they did not concretise the interpretations of parents and/or teachers. For example, if an informant calls a student 'perfectionistic', this was rather often considered a fact instead of a subjective opinion. Instead, it should be a prompt for the psychologist to inquire about what exactly the perfectionist behaviour looks like and when it occurs, et cetera[i].

Another thing that struck the trainer was that in the investigation stage, the participants fairly often put a test score in the wrong column. The trainer also reported that participants found blended course groups, consisting of educational as well as clinical psychologists from various practices and settings, to be of added value in the S&W-Heuristic trainings, because both disciplines provide different views and supplementary approaches regarding assessments and interventions.

Results Phase 5: Prelude to New Theoretical Perspectives

Based on the literature and practical experiences, we redefine the concept of twice-exceptionality in the context of education and youth mental health care as follows: 2E is the co-

occurrence of very high intellectual capacities and/or very high learning outcomes on the one hand and learning, developmental and/or behavioural problems on the other. The latter may include characteristics of adhd, asd, specific learning disorders, or non-cognitive problems (e.g., Beckmann & Minnaert, 2018; Burger-Veltmeijer, Minnaert & Van Houten-Van den Bosch, 2011; Foley-Nicpon et al., 2011; Rommelse et al., 2016; Van Viersen et al., 2016). But, in our definition, a formal classification/diagnosis is not a prerequisite for 2E. Characteristic of 2E, though, is an underlying (neuro)cognitive and/or didactic developmental profile with substantial intra-individual discrepancies between (very) high strengths and relative or absolute weaknesses, which may entail special psychoeducational needs (Burger-Veltmeijer et al., 2019).

Camouflage of both the Ss and the Ws or both may occur, but seems to be mainly related to one-sided perspectives of parents and/or professionals. This can be prevented by looking at the problems from more perspectives and by being constantly alert to bias. The systematicity of the S&W-Heuristic may be of optimising help in this process.

In science and psycho-educational practice, IG and 2E are regarded as separate conceptual categories. We propose to abandon this view and to consider both as constructs that lie on the same continuum, stretching from IG with no problems on the one hand to IG plus very severe problems on the other. This circumvents the fact that giftedness is defined in very different ways. And, more importantly, it places less emphasis on criteria for 'labels' and it paves the way to dimensional needs-based assessment processes. Moreover, it does justice to all those very intelligent students with discrepancies in their cognitive profiles who may not meet the cut-off criteria for some gifted programs, or do not (fully) fit any of the various disorder-categories. And finally, scientists would have less need to talk at cross purposes, which might facilitate polemics regarding the identification of IG and various 2Es (see e.g.: Rommelse & Slaats-Willemse, 2020a, 2020b; Vogelaar & Hoogeveen, 2020a, 2020b).

CONCLUSION AND DISCUSSION

The S&W-Heuristic offers systematic guidelines for psychologists and special educationalists regarding assessments of (potential) gifted or 2E-students, in education as well as in clinical settings. Its systematicity helps to focus less on diagnostic labels and to diminish the chance of biased perspectives. Moreover, it helps to unveil hitherto camouflaged strengths or weaknesses and to tailor assessments more adequately to the psychoeducational needs of individual students. As such, it has the potential to tackle the internationally recognized problem of misdiagnoses in the realm of giftedness and 2E.

The S&W-Heuristic is, however, not an algorithm or a ready-made product, it rather is a heuristic mindset that needs instruction and training. Moreover, implementation fidelity takes time. Psychologists and other professionals are often experienced or experts in either giftedness, or in one or more disorders, but seldomly in both. Therefore, adequate

implementation of the S&W-heuristic requires postmaster courses, preferably organised with blended groups of educational and clinical psychologists with different areas of expertise.

So far, some first validations of the S&W-Heuristic have been performed. The evaluation of the latest version, the questions among 37 participants and the trainer, was, however, retrospective in nature and not performed in a fully systematic way. In line with the cyclical nature of design research, the design of the S&W-Heuristic needs to be further researched systematically and optimised in the future, preferably by means of a prospective study design. For instance, concerning the sorts of and the number of dimensions, as well as the feasibility of the principles of the S&W-Heuristic in different settings. For instance, by means of surveys and (semi-)structured interviews, and dossier-analyses in clinical as well as educational settings.

As a product of design research, this article also offers a prelude to new theoretical perspectives, a paradigm change. In line with the principles of the S&W-Heuristic, it is expedient to shift from a 'classification-based' to a dynamic 'dimensional-based' view regarding the concepts IG and 2E and to consider both as constructs on a continuum.

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[i] Please be aware that the score for negative fear of failure is low, but in the S&W-profile the level is shown in the column S+, since the S&W-profile illustrates weaknesses at the left-hand side and strengths at the right-hand side. Therefore, low scores on negative fear of failure, indicative of a strength, are placed on the right, and vice versa.

[i] It is essential for the psychologist to recognise and concretise interpretations of clients in the intake stage, so that an impression can be obtained whether this interpretation (in this case 'perfectionism') may be related to an emotional cause (such as low self-esteem or fear of judgement) and/or a neurocognitive cause (such as weak central coherence or cognitive inflexibility), and consequently to be able to decide in the strategy stage of the S&W-Heuristic which dimensions are indicated to assess in the investigation stage. In the intake stage, at the very beginning of the needs-based assessment procedure, the systematicity of the S&W-Heuristic starts up. If this start is biased, then the whole assessment could be performed in a biased way (see for instance Burger-Veltmeijer et al, 2015, 2016).