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The scale for emotional development-revised (SED-R) for persons with intellectual disabilities and mental health problems: development, description, and reliability

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Objectives: The Scheme for Appraisal of Emotional Development (SAED, Došen, 1997) is intended to evaluate the emotional development of persons with intellectual disabilities (ID), especially those with co-occurring problem behaviour. In 2012, The Scheme for Appraisal of Emotional Development-revised (SED-R) was developed in Dutch, based on the SAED. This paper aims at providing a description of the SED-R, its development, and results from an inter-rater reliability study.

Methods: The study was carried out in services that support persons with ID in Flanders, the northern part of Belgium. For each client, the SED-R was administered twice with the same informants by two different trained interviewers at different points in time, with a 1-week minimum and 3-week maximum between assessments 1 and 2. Cronbach's Alpha coefficient was calculated in order to estimate the internal consistency. The degree of agreement between the scores of the assessment pairs at time 1 and time 2 (which could be regarded as test-retest reliability) was expressed in Spearman's rho. For the extent of inter-rater agreement, the intraclass correlations coefficient (ICC) was applied.

Results: The reliability results indicate that the SED-R generally shows a high internal consistency. The total and average score of the SED-R show a substantial inter-rater reliability. Ten out of 13 domains show moderate to substantial inter-rater reliability.

Conclusion: The results are discussed in relation to four notions: robustness, utility, understanding, and relevance. It is necessary to generate more knowledge with regard to the validity, reliability and applicability of the SED-R, warranting further research.

Keywords: emotional development, psychometrics, intellectual disability, social development, SED-R

Introduction

Role of emotion and cognition in understanding behaviour and personality development

Based on current knowledge in developmental neuroscience, emotions are assumed to be a function of basic survival needs (feeding, protection, reproduction, and social contact) activated by subcortical and cortical brain systems (LeDoux 2002). The stimuli that activate these systems result in motivations responsible for particular behaviour (Kernberg 2012; LeDoux 2002; Panksepp and Biven 2012).

Some researchers (LeDoux 2002; Kandel 2006; Panksepp 2003; Panksepp and Biven 2012) refer to two distinct but interacting neural systems – a cognitive and an emotional system – that can develop independently of each other. A balanced development of these two systems may play an important role in personality development, as well as mental health status.

A dissociation between emotion and cognition has been reported among children with Down syndrome, autism spectrum disorders, and children raised in abusive and impoverished environments (Cicchetti and Ganiban 1990; Izard *et al.* 2006). Indeed, an intersystem connection between emotion and cognition in these children fails to develop, often leading to problems in social behaviour (Izard *et al.* 2006). A

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similar discrepancy between cognitive and emotional development has been shown in persons with intellectual disabilities (ID) and mental health problems (Došen 2005a, 2008; Sappok *et al.*, 2013a, 2013b).

It is evident that, in addition to knowledge regarding the level of cognitive development, information on the level of emotional development is necessary to properly understand the meaning of a person's behaviour. Until now however, the emotional development and its role in psychosocial development and the onset and management of mental health problems in persons with intellectual disabilities, has been of limited scientific interest. This lacuna has been primarily covered by the so-called developmental-dynamic approach (Došen 1990).

Developmental approach: understanding relations between cognition, emotion, and behaviour

Based on this approach, Došen (2005a, 2007, 2008) emphasized the necessity to include the developmental dynamics of different personality aspects (biological, cognitive, social and emotional) within the current psychiatric paradigm. Došen (2007) supplemented the classic bio-psycho-social model with the developmental dimension, specifically for persons with intellectual disabilities. Došen (2007) attributed a central place to emotional development in the personality structure. More specifically, Došen (2007) developed a five-stage model of normal emotional development for children from 0 to 12 years of age (cf. Table 1).

To construct an assessment tool that would be applicable for determining the level of emotional development in persons with intellectual disabilities, Došen (1990) developed the Scheme for Appraisal of Emotional Development (SAED). For this purpose, 10 aspects or domains of psychosocial development, that had emerged from practice and earlier investigations with children with ID, were utilized (i.e. how the person deals with his/her own body, interaction with the caregiver, interaction with peers, handling of material objects, affect differentiation, verbal communication, anxiety, object permanency, experience of self, and aggression regulation). The SAED was developed in consideration of the changes that take

place in these 10 domains during the five developmental phases.

Discrepancy between cognitive and emotional development and implications for clinical practice

Using the SAED in clinical practice and differentiating between emotional, social and cognitive developmental levels, the behaviour (including challenging behaviour), of people with intellectual disabilities could be better understood (Došen 2014; Sappok 2013b). In cases of a discrepancy between these aspects, it was striking that emotional development was regularly found at a lower level than cognitive development. In such cases, there were difficulties in understanding the basic emotional needs of the person, with over-demanding and -stimulation leading to challenging behaviour of the person. From this perspective, challenging behaviour is no longer considered as intentionally oppositional or as a result of a psychiatric disorder; rather, as a consequence of an inappropriate interaction between the person and the environment in which misunderstanding and miscalculation of the environment concerning the person's basic emotional needs was the trigger of the conflict.

It is peculiar however that, until now, researchers have paid little attention to the development of assessment instruments for emotional development. In contrast, a number of instruments to assess psychopathology in persons with ID have been developed (Matson *et al.* 2012), which is important as psychopathology and emotion (dys)regulation are interrelated. The few attempts to measure emotional development include: the Infant-Toddler Social and Emotional Assessment (ITSEA) developed by Carter and Briggs-Gowan (2000), the Functional Emotional Assessment Scale (FEAS), developed by Greenspan, DeGangi and Wieder (2001), the Frankish tool to measure the emotional development of persons with AD, based on the theory of Mahler (Frankish 2013), and the ESSEON-R Schaal voor het Sociaal-Emotionele OntwikkelingsNiveau [ESSEON-R Scale for the Social-Emotional Developmental Level] developed by Hoekman *et al.* (2014). Each of these instruments attempts to measure aspects of social-emotional development.

Table 1 Scheme of emotional development and personality structuring (Dosen 2005a)

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
0–6 months	6–18 months	18–36 months	3–7 years	7–12 years
Adaptation	Socialization	Individuation	Identification	Reality awareness
Psycho-physiological homeostasis	Secure attachment, bonding,	Self-other differentiation	Ego-forming	Ego-differentiation
Integration of sensory stimuli, integration of structures of time, place and persons	Secure emotional base	Objective-self, Separation, Autonomy	(impulsive ego)	(moral ego)

The SAED is different from these instruments by focusing on emotional development and on differentiation from social and cognitive development. In so doing, the SAED is contributing to a better understanding of the person's basic emotional needs, specific personality traits, and behaviour features.

A correlation study between the SAED and the Vineland Adaptive Behavior Scales (VABS – an instrument to measure adaptive abilities) in a sample of 33 adults with intellectual disabilities without psychiatric or behaviour disorders was performed by La Malfa and colleagues (2009) showing statistically significant positive correlation between the two scales, more in particular between SAED and the 'Socialization', 'Communication' and 'Daily Living Skills' domains of the VABS. As might be expected, there is no statistically significant relationship between VABS-'Motor Skills' and the SAED. The positive relationship between SAED and VABS-'Socialization' underscores the significance of emotions in relation to social development of persons with intellectual disabilities, indicating that an increase in emotional development accords with an increase in social development. It is also noteworthy that the positive relationship between emotional development and VABS-'Communication' and 'Daily Living Skills' signifies that emotional development and adaptive development (comprising social development) are interrelated; a finding which is further validated, according to La Malfa *et al.* (2009), by the absence of a relationship between SAED and 'Motor Skills'. An important question remains whether or not these findings on the relation between adaptive, emotional and social development also apply for persons with ID and co-morbid mental health problems.

Aims and objectives

In several publications, researchers from different countries (The Netherlands, Belgium, Germany, and Italy) agree on the practical relevance of the SAED, although the instrument has not yet been extensively validated (Claes and Verduyn 2012; La Malfa *et al.* 2009; Sappok *et al.* 2013a). Recently, Došen and a group of Belgian professionals, supported by and situated within Steunpunt ExpertiseNetwerken (SEN), took the initiative to make the SAED more accessible for use in daily practice. As a result, the Scale for Emotional Development-Revised (SED-R) was developed. The current lack of psychometric data (validity and reliability) on the SED-R is an important obstacle in further implementing the scale in the field, and for scientific research on the role of emotional development in this population. As a first step, systematic description of the SED-R and its development and the results from a reliability study are provided herein. The first section will focus on the development and description of the SED-R

(based on Claes and Verduyn 2012); the second section will describe the results on reliability.

SED-R: development and description

Development

As described earlier, the SAED is a tool that is frequently used in The Netherlands and Belgium, mostly in the field of intellectual disabilities and mental health care. The SAED is applied as part of an integrative assessment, diagnosis and planning process in diverse living, support, and treatment services. The SAED is used for persons with or without co-occurring challenging behavior or mental health needs. Increasingly, the SAED has been used lately with other target groups, including persons with autism spectrum disorders, acquired brain injuries and profound and multiple disabilities, as well as in other fields, such as youth support, special education, social welfare and forensic services.

Yet, clinicians have been confronted with a number of challenges; specifically, the terminology from child psychiatry is difficult to transfer to the support of adults with ID (certainly for those clients with a mild intellectual disability). Many items have been shown to be difficult to interpret unequivocally. The lack of a manual and the translation towards the daily support situation, as well as an indistinct scoring procedure and interpretation were mentioned as difficulties. Because of the perceived clinical relevance, a group of Belgian clinicians adapted the instrument.

The original SAED consisted of 10 domains that counted three items each. These domains were described as follows: (1) how the person deals with his own body; (2) interaction with the caregiver; (3) interaction with peers; (4) handling material objects; (5) affective differentiation; (6) verbal communication; (7) anxiety; (8) object permanence; (9) experience of self; and (10) aggression regulation. The emotional development was rated on a five-item-scale, as set forth by Došen (2005a; 2005b): (1) adaptation (0–6 months); (2) socialization (6–18 months); (3) individuation (18 months–3 years); (4) identification (3–7 years); and (5) reality awareness (7–12 years) (cf. Table 1).

Based on feedback by clinicians, the SED-R (cf. Fig. 1) was developed within an expert group composed of professionals with a diagnostic expertise for persons with ID and with knowledge about emotional development and the SAED. The expert group was supervised by Došen. The development process, that took more than 2 years, was based on an extensive literature review, expert consensus meetings to select and describe the items, and the administration of pilot versions to fine tune the scale (see Claes and Verduyn 2012 for a comprehensive

SED-R	Stage 1 0-6 mo Adapation	Stage 2 6-18 mo First Socializa- tion	Stage 3 18 mo-3y Individu- ation	Stage 4 3-7y Identifi- cation	Stage 5 7-12y Reality awareness
1. Dealing with own body					
2. Dealing with emotionally important others					
3. Self-image in interaction with the environment					
4. Dealing with a changing environment – Object permanence					
5. Anxieties					
6. Dealing with peers					
7. Dealing with materials					
8. Communication					
9. Emotion Differentiation					
10. Aggression Regulation					
11. Day activity – play development					
12. Moral development					
13. Emotion Regulation					

Figure 1 Sample score Form SED-R (Claes and Verduyn 2012).

overview of the scale and its development). The SED-R consists of 13 domains, including the original 10 from the SAED, that were adapted and supplemented. Some of the domains have been restructured and/or renamed. For example, the domain ‘interaction with the caregiver’ is enlarged and specified into ‘dealing with emotionally important others’. The following three new domains were added: ‘day activity

– play development’, ‘moral development’ and ‘emotion regulation’ (Claes and Verduyn 2012, p. 15).

The following text briefly summarizes some key aspects with respect to the SED-R: the target group, aim, scale structure, administration, scoring and interpretation. This summary is based on the SED-R-manual by Claes and Verduyn (2012), which was developed as part of a larger project on emotional

Phase 1 0 – 6 months	
Core	Sends emotional signals to regulate internal tensions.
Development	<ul style="list-style-type: none"> a. The whole body is used for expressing oneself. b. He displays no conception nor usage of language.
Examples	<ul style="list-style-type: none"> c. The way in which emotional signals are sent, varies from crying, disregulating, screaming, taking hold of and entraining a care taker, nervously walking around,... to jabbering, repeating words, using empty/hollow words,... d. He uses stereotypical expressions or words. e. He imitates 'facial expressions', sounds, words, ... f. The way of saying something (e.g. intonation) is more important than the content.

Figure 2 Example of scale structure (Claes and Verduyn 2012).

development in persons with ID, funded by SEN (cf. supra). Several of the authors of the present paper participated in this project.

Target group

The SED-R was developed to assess the emotional development of children, adolescents and adults with ID. The SED-R is based on 'typical' emotional development between 0 and 12 years of age (Claes and Verduyn 2012). The SED-R should be considered from the perspective of the continuum that incorporates adaptive behaviour, maladaptive behaviour and psychiatric disorders, as described by Došen (2014).

Aim

The SED-R is not a classification or a diagnostic instrument; rather, the SED-R is a discussion tool that focuses on eliciting interactions regarding the emotional development of a person with ID. The SED-R aims at reaching a commonly-shared evaluation. A diagnosis of ID based solely on emotional development, without referring to intellectual functioning and adaptive behaviour (cf. Schalock *et al.* 2010), is not recommended. One always has to consider the dynamic interrelations of emotions and behaviour, i.e. by looking for the basic emotional needs and motivations underlying the behaviour. Moreover, evaluation of an adaptive-maladaptive behaviour-psychiatric disorder is only possible by integrating the emotional development with another dimension of personality development, such as biological, cognitive and social (Claes and Verduyn 2012).

Scale structure

Each phase of emotional development in each domain is described according to a fixed structure

that consists of three elements (Fig. 2). The core indicates the most important development per phase in a given domain. In the development section, the evolution of the 'typical' emotional development per phase is further elaborated and described, with the aim to clarify and illustrate the 'core'. The examples describe behaviour as it could occur in persons with ID, but does not necessarily have to. Again, the attributed developmental phase is always dependent on the emotional needs and motivations underlying the behaviour (Claes and Verduyn 2012).

Administration

The scale is rated on the basis of behavioural observations using a semi-structured interview with a minimum of two informants who know the person well (Claes and Verduyn 2012).

The person who administers the scale (the interviewer) has to dispose of sufficient background knowledge of 'emotional development', which is the developmental-dynamic approach of Došen and developmental psychology of normally developing persons. Training on this framework and the administration of the SED-R is obligatory (Claes and Verduyn 2012).

Scoring and interpretation

The SED-R is developed to enable the interviewer to engage in a dialogue with the informants, using the 'inter-subjective discussion' method. The assessment of emotional development is indeed closely connected to the support staff member's expectations of a client. The interviewer stimulates this discussion/dialogue by asking questions and by looking for behaviour that points to the direction of a certain level of emotional development. Rather than focusing on whether the

SED-R	Stage 1 0-6 mo	Stage 2 6-18 mo	Stage 3 18 mo-3y	Stage 4 3-7y	Stage 5 7-12y
	Adapation	First Socializa- tion	Individu- ation	Identifi- cation	Reality awareness
1. Dealing with own body	X				
2. Dealing with emotionally important others		X			
3. Self-image in interaction with the environment	X				
4. Dealing with a changing environment – Object permanence		X			
5. Anxieties	X				
6. Dealing with peers		X			
7. Dealing with materials	X				
8. Communication		X			
9. Emotion Differentiation	X				
10. Aggression Regulation		X			
11. Day activity – play development	X				
12. Moral development	X				
13. Emotion Regulation	X				

At the time of the administration, the level of emotional development is not higher than 6 months.

Figure 3 Example of harmonic SED-R profile (Claes and Verduyn, 2012, p. 24).

question ‘occurs/does not occur’, the interviewer gauges basic emotional motivations and needs. Therefore, it is important that the interviewer is familiar with developmental psychology and psychiatry, as he/she must rate each domain within one of the five stages of emotional development.

Special attention is given to the distribution of scores over the 13 domains, which can be harmonic, disharmonic, or discrepant. Harmonic profiles indicate a more or less equal score for the different domains, while a disharmonic profile means that a person is rated in different phases over the domains; a discrepant profile signifies that the person functions much lower emotionally than intellectually [(cf. Figs. 3 and 4 for examples of a harmonic and disharmonic profile respectively (Claes and Verduyn 2012)].

A discrepant profile refers for instance to a personality structure of a person with a mild intellectual disability (cognitive developmental age of 7–11 years old) whose

emotional development has stagnated at the age of 3 years or younger. This person appears much stronger concerning general appearance, communication and skills compared to what he can cope with on an emotional level.

Figure 3 depicts an example of a harmonic profile of emotional development. The interviewer rated the 13 domains in phases 1 or 2. With respect to the total ‘score’, the rating is applied to at least seven domains used. In this example, the emotional development is rated as corresponding with the adaptation phase. This signifies that, although this person functions emotionally at a basic level, his emotional development is structured quite homogeneously. This entails that this network may be able to attune its support to the emotional needs associated with this basic emotional developmental phase.

Figure 4 shows a disharmonic profile of emotional development. A client’s emotional development is situated in four different phases. In order to obtain the total ‘score’, seven scores are counted, beginning from

SED-R	Stage 1 0-6 mo	Stage 2 6-18 mo	Stage 3 18 mo-3y	Stage 4 3-7y	Stage 5 7-12y
	Adapation	First Socialization	Individuation	Identification	Reality awareness
1. Dealing with own body				X	
2. Dealing with emotionally important others			X		
3. Self-image in interaction with the environment			X		
4. Dealing with a changing environment – Object permanence		X			
5. Anxieties			X		
6. Dealing with peers		X			
7. Dealing with materials			X		
8. Communication		X			
9. Emotion Differentiation	X				
10. Aggression Regulation			X		
11. Day activity – play development		X			
12. Moral development			X		
13. Emotion Regulation			X		

At the time of the administration, the level of emotional development is not higher than 3 years.

Figure 4 Example of dysharmonic SED-R profile (Claes and Verduyn 2012, p. 25).

the lowest score. The emotional development is phrased 'level of emotional development is equal or lower than (the score on the 7th domain)', in this case the individuation phase (3 years of age). These clients do not only show a discrepancy between cognitive and emotional development, but even within the dimension of emotional development, extreme values in both directions are observed. Accordingly, support in general should, in this case, be attuned to a moderate level of emotional development, and will, at the same time, also have to consider a different approach for the domain of 'dealing with own body' as compared to the domain of 'emotion differentiation'. The latter for instance will still be very immature and undifferentiated.

Claes and Verduyn (2012, p. 23) discussed the following aspects, amongst others, with respect to

interpreting the SED-R: the scale should be used in a dynamic way and the level of emotional development is an indication for a person's support instead of being considered fixed and invariable; the level of emotional development assessed by the scale can provide an explanation for particular behaviours in persons with Autism Spectrum Disorder (ASD; Sappok 2013a); it is important to transfer the SED-R-rating to the tangible practice of support, during which the context should be taken into account; and special attention is necessary for disharmonic and discrepant development profiles.

Methodology

Setting and participants

The study was carried out in services that support persons with ID in Flanders, the northern part of Belgium. These services were contacted by e-mail in

collaboration with the Steunpunt Expertise Netwerken – Social-Emotional Development ('SEN-SEO') working group, which operates within SEN vzw, the interface centre previously mentioned. This working group focuses on developing and disseminating expertise on social-emotional development in persons with ID. The contacted professionals, who served as interviewers, had either followed a training on the SED-R or had previously shown interest in social-emotional development of persons with ID as known by members of the SEN-SEO working group.

The interviewers had to fulfil the following criteria: (1) the interviewer is a master in special education/psychology, a psychiatrist, or has a diagnostic function in the service; (2) the interviewer has experience in using the integrative model by Došen and has already administered the SAED or SED-R; (3) the interviewer is willing to administer the SED-R to a number of clients; and (4) the interviewer (and the organization he or she works in) is prepared to randomly select 4–5 clients in its own organization from whom a SED-R can be administered.

The study was set up in accordance with the ethical regulations of the General Ethical Protocol of the Faculty of Psychology and Educational Sciences at Ghent University. Informed consent from the informants was obtained and all data were registered and analysed anonymously. The anonymous data files were only accessible to the researchers. The SED-R scale that was administered in the service was kept in the client's personal support file (stored in the treatment service) as the individual results are an integral part of the client's global assessment and treatment plan.

Twenty-four interviewers were recruited, 15 and 5 of whom had a degree in special education and psychology, respectively (missing=4).

Based on a random selection, 67 clients were retained for whom the SED-R was administered in the natural (treatment service) setting. The clients were more often male (56%) (missing=10), had a mean age of 34.33 years (SD=16.51, range: 7–75) (missing=7), and 74% had co-existing psychiatric or behavioural problems (missing=9). The level of IQ was mild (36%), moderate (41%), severe (17%), and profound (5%) (missing=9).

Of the 67 clients, 54% lived in a residential service; 13% lived at home in the community, with or without additional support; 4% lived in foster care families; 3% lived in supported or sheltered living in the community; and 1% lived at home and at another living arrangement. In 13% of the cases, the living arrangement was not clear on basis of the registration and in 10% no information was provided.

Procedure

For each client, the SED-R was administered twice with the same informants by two different trained

interviewers at different points in time with a 1-week minimum and 3-week maximum between assessments 1 and 2. The informants were mostly female (78%), with a mean age of 37.9 years old (SD=11.43). 85% were professionals, and 15% were social network members. Before the study was carried out, a training moment was organized in order to prepare the interviewers.

Data-analysis

For the analyses, we have used the thirteen ratings on each domain, the total rating (based on the procedure for harmonic and disharmonic profiles previously mentioned) and the mean rating (based on the average of the thirteen domains). Cronbach's Alpha coefficient was calculated to estimate the internal consistency. Due to the ordinal nature of the data (scores are 1–5 for each domain and the total rating), the degree of agreement between the scores of the assessment pairs at times 1 and 2 (which offers information about the test-retest reliability) was expressed as Spearman's rho. As the data are normally distributed and ranging from 1 to 5, we have used Pearson correlation for the mean rating and we have compared the average ratings of interviewers 1 and 2 by means of a paired samples *t*-test. The extent of inter-rater agreement was expressed in the intraclass correlations coefficient (ICC), which mathematically equals the weighted kappa-coefficient using quadratic weights (Fleiss and Cohen 1973; Norman and Streiner 2008). Unlike the percentage of exact agreement or the regular kappa-coefficient, the weighted kappa-coefficient is appropriate for use with ordinal data as it takes 'partial agreement' into account (e.g. if one is assessed by rater one as being in phase 1 and by rater two as being in phase 2 as compared to another case in which one rater assesses someone as being in phase 1, whereas the other considers the client as being in phase 5, Vierra and Garret 2005). As the ICC is furthermore recommended by some authors for inter-rater reliability using ordinal and interval-level data (Tinsley and Weiss 2000; *n.b.*, there is some debate regarding this, cf. Jacobsson and Westergren, 2005), the ICC has been reported. In agreement with the recommendation by Uebersax (2014), we have also reported the raw percentages of exact agreement for each domain and the total score (by dividing the number of corresponding ratings by the total number of ratings). Using SPSS22, we computed the 'two-way mixed' ICC, with 'absolute agreement'.

Results

The SED-R internal consistency with 13 domains (N=115) is high, with a Cronbach's Alpha-value of 0.95.

The correlation matrix (Spearman rho) shows statistically significant positive relationships among the domains (cf. Table 2).

In Table 3, the Spearman rho correlations and intraclass correlation coefficients (ICC) for all domains and the total score are reported. As the interpretation of the Spearman rho is comparable to the interpretation of Pearson correlations, we used the interpretation guideline for Pearson correlations by Guilford (Guilford and Fruchter 1973) to interpret the strength of the relationship: <0.20, negligible; 0.20–0.40, low; 0.41–0.70, moderate; 0.71–0.90, high; and >0.90, very high. With respect to ICC, we used the interpretation guidelines by Landis and Koch (1977), as follows: 0, poor; 0.01–0.20, slight; 0.21–0.40, fair; 0.41–0.60, moderate; 0.61–0.80, substantial; and 0.81–1, almost perfect.

The results for the total score show that there is a high correlation between the scores of independent interviewers [Spearman $r(57)=0.75$]. With regard to the average score, we found a Pearson correlation of $r(61)=0.76$. No significant differences were found between the average scores of interviewers 1 ($M=2.5$) and 2 ($M=2.6$) [$t(52)=-1.016$, $P=0.315$].

For all 13 domains significant correlations were found, ascertaining mostly moderate-to-high (for one domain: dealing with peers) correlations between interviewers for most domains. Nevertheless, some correlations were weak, in particular domain 9 (affective differentiation), domain 10 (aggression regulation) and domain 13 (emotion regulation) as these scores fell in the range of the cut-off value for a 'low' correlation.

For the total score there is a substantial level of agreement. This same is true for the average score (ICC=0.76). For 10 of 13 domains a moderate to substantial level of agreement was found. Comparable to the correlation indices, the ICC scores were weaker for domains 9, 10, and 13, as these scores fell in the range of the cut-off value for a 'fair' agreement.

Based on the Spearman rho and ICC, we can conclude that the total and average score of the SED-R shows substantial inter-rater reliability, and 10 of 13 domains show moderate-to-substantial inter-rater reliability scores. In agreement with the previous results, 3 of 13 domains have low scores (domain 9, 10, and 13).

Discussion and conclusions

This paper aimed at describing the SED-R and its development, as well as reporting on its reliability. The results will be discussed in relation to four key notions with regard to scale development, as proposed by Claes *et al.* (2010). These notions refer to robustness, utility, understanding, and relevance. *Robustness* refers to the psychometric qualities (e.g. internal consistency, test-retest-reliability, ...) of an instrument; *utility* relates to the application of an instrument and the implications of the results on a micro-, meso- and macro-level; *understanding* refers to how we should correctly assess and interpret the construct (i.e. emotional development) in relation to the persons who are being assessed; and *relevance* refers to why it is important to assess the theoretical construct, in this case emotional development. For each of these aspects, related opportunities of using the SED-R, as well as potential challenges and future research topics, will be considered.

Robustness

The reliability results indicate that the SED-R generally shows a high internal consistency. The total and average score of the SED-R show substantial inter-rater reliability. Ten of 13 domains show moderate-to-substantial inter-rater reliability.

Low scores of degrees of agreement and exact agreement were observed for the same three domains, as follows: domain 9 (differentiation of emotions); domain 10 (regulation of aggression); and domain 13 (regulation of emotions). Different explanations can be advanced to clarify these results. Domains 9 and 10 contain items that are sensitive for equivocal

Table 2 Correlation matrix 13 domains (Spearman rho)

	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13
D1	1	0.69	0.61	0.73	0.67	0.63	0.62	0.63	0.55	0.62	0.71	0.62	0.66
D2		1	0.72	0.71	0.68	0.53	0.57	0.57	0.58	0.58	0.62	0.55	0.63
D3			1	0.70	0.73	0.47	0.61	0.63	0.59	0.59	0.59	0.57	0.71
D4				1	0.75	0.66	0.67	0.63	0.48	0.58	0.68	0.62	0.63
D5					1	0.63	0.66	0.66	0.51	0.60	0.64	0.60	0.67
D6						1	0.68	0.63	0.59	0.53	0.56	0.54	0.50
D7							1	0.63	0.53	0.54	0.67	0.60	0.59
D8								1	0.63	0.64	0.63	0.68	0.66
D9									1	0.61	0.60	0.54	0.61
D10										1	0.46	0.57	0.65
D11											1	0.55	0.56
D12												1	0.67
D13													1

Note: all correlations are significant at 0.01 level.

interpretations. A sharper and more concrete item-description could improve inter-rater reliability. Domain 13 was recently added to the new version of the scale. Due to limited assessment experience with this domain, it proved to be more difficult to adequately explain during training of future interviewers. These results imply suggestions to refine the manual and the guidelines for using the scale, which is already carried out by an expert-group.

Key questions within this aspect refer to generating more knowledge with respect to the validity, reliability, and applicability of the SED-R, warranting further research on these matters.

Utility

On a micro- and meso-level, assessment using a valid and reliable SED-R could enable professionals to (1) assess the basic emotional needs of a client to take the needs into account in a timely and adequate fashion; (2) stimulate adequate social and emotional behaviour of parents/professionals and other caregivers concerning sensitivity and responsiveness; (3) improve assessment, diagnosis and identification of type and intensity of support needs; and (4) improve the planning and development of a system of supports for clients with and without behaviour and psychiatric problems (Schalock 2010). Furthermore, on a meso- and macro-level, assessment could (1) stimulate scientific research and (2) improve the quality of support and care for his population. Most importantly, adequate supports, adjusted to the emotional development of the person, could lead to an improved quality of life for persons with ID and mental health problems, which has implications at the micro-, meso- and macro-levels. For example, if a client is obstructed in an emotional development of the adaptation phase (0-6 months), aggression and agitation should be understood as bemusement and dysregulation, rather than

as intentional aggression. From a diagnostic point of view, concepts such as conduct disorder, antisocial behaviour or personality disorders, are not correct in this respect. Another example refers to how to support a client who is situated in the socialization phase (6–18 months). Support staff should be emotionally available, rather than focusing on autonomy and individuation.

The SED-R and its application are grounded in more comprehensive treatment planning. As such, using the scale should not be considered as something separate, but rather as an integrated part in a successive and continuous assessment and support cycle. This is especially important as emotional development is a dynamic variable that could be influenced by a diversity of aspects and life events. Key questions in this regard are how to integrate and consolidate the heightened attention for emotional development in treatment and support settings (Došen 2007) and how to consider the heightened attention as a concept that changes over time.

Understanding

It is important to consider the SED-R as an assessment, rather than as a diagnostic or classification instrument. The SED-R is conceived as a discussion and reflection tool that, albeit structured and psychometrically sound, merely fosters a dialogue between caregivers and family members on a client's emotional development. This should always be integrated in a broader and integrative perspective that is reflected in the underpinning model (Došen 2007). When doubts arise about how to assess and interpret behaviour, one should always refer back to the developmental model, as specific behaviour cannot always be simply traced back as an indication of specific emotions. Rather, emotions relate to an individual's basic needs and motivations. Fear, for

Table 3 Spearman rho correlation, intraclass correlation coefficients (ICC) and exact agreement for all domains and total score for assessment 1 and 2

	Correlation	Agreement	Agreement
Domain	Spearman Rho	ICC	Exact*/%
1. Dealing with own body	0.67	0.62	53
2. Dealing with emotionally important others	0.52	0.54	60
3. Self-image in interaction with the environment	0.58	0.61	56
4. Dealing with a changing environment – object permanence	0.63	0.59	48
5. Anxieties	0.50	0.56	47
6. Dealing with peers	0.73	0.73	59
7. Dealing with materials	0.66	0.69	47
8. Communication	0.60	0.66	53
9. Emotion differentiation	0.35	0.36	48
10. Aggression Regulation	0.32	0.30	45
11. Day activity – play development	0.61	0.55	52
12. Moral development	0.51	0.52	57
13. Emotion Regulation	0.36	0.35	46
14. Total Score	0.75	0.73	67

Note: *The percentage exact agreement has been calculated by dividing the number of corresponding ratings by the total number of ratings.

example does not reveal much, as long as fear is not considered in connection to the context and the intrinsic needs it is related to. The assessment of emotional development leads to an overview of emotional needs, e.g., peace, the dosage of stimuli, having a place of one's own, structure, a balance between distance and proximity, non-judgmental restriction, and being able to make choices. It is essential that support staff really consider how to create an environment or how to develop support which matches with these emotional needs. Thus, how can support staff attune to the clients' needs, rather than trying to 'change' the client?

A challenge in this regard has to do with the time needed to assess social and emotional development. As this process takes the form of a dialogue, a sufficient amount of time is necessary (at least 1.5 hours). Yet, in daily practice, time is not always 'on our side', which raises the question whether or not a shortened assessment is possible or even desirable. Again, more research into the applicability of shortened versions of the SED-R could deliver important information with respect to how emotional development can be (further) integrated in treatment and support.

Relevance

The importance of emotional development is universal, inclusive and common for everyone, as it is a basic aspect in human functioning (Nykliček, Vingerhoets and Zeelenberg 2011). Emotional well-being is one of the eight domains of Quality of Life (Schalock and Verdugo 2002) and the importance is emphasized in the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) (Verdugo *et al.* 2012). Until now, scientific literature has been focusing primarily on inclusion, self-determination and health. These concepts are linked with important domains of QOL and corresponding articles from the UNCRPD Convention. Now, it is important to also focus on emotional well-being, e.g. by means of the SED-R. Therefore, we think it is essential to make this aspect more visible and to further integrate it with other paradigms that are currently used in the field of disability, such as mentalization, Quality of Life and the support approach grounded in a social-ecological model (Buntinx and Schalock 2010; Thompson *et al.* 2009). An important strength of using the SED-R and its underpinning approach is that it surpasses an approach that is merely focused on behaviour and symptoms by focusing on the importance of basic needs and motivations. Instead of considering behaviour as challenging, disturbed, and maladaptive, it can be considered as normal, coping, and adaptive for emotionally low-functioning persons who are confronted with stress and discomfort. Therefore, it

broadens the view of solely treating persons with ID and challenging behaviour, by means of behaviour modification therapy, pharmacologic approaches and other medical interventions, towards involving the importance of considering and adjusting the environment and context in which people live, as emphasized in the supports model (Schalock *et al.* 2010; Buntinx and Schalock 2010). From this perspective, it warns us for the over-medicalization and over-problematization of behaviour that is used to cope with stress and other forms of discomfort.

The present study had some limitations that should be considered when interpreting the results. First, the number of clients was rather small ($n=67$), especially when considering that a large number of interviewers ($n=24$) were used. Second, because participants have been randomly selected, the sample varied on a number of (demographic) variables [level of ID, age (which is characterized by a wide range), and presenting with or without co-occurring mental health problems], which impeded control of these variables due to the small sample size. As we did not have much information on the interviewers and informants and given the small sample size and missing values, it was not possible to investigate if and how the characteristics might have influenced the results. Third, this study only focused on inter-rater- (and to certain degree also test-retest) reliability, which are essential, but certainly not the only reliability aspects that should be investigated. Fourth, the Cronbach Alpha measure may vary given the number of items and underlying factors (Cortina 1993). As there have been no studies until now on the factor structure of the SED-R, the reported figure should be considered with caution and is due to further investigations with attention for the aspects mentioned above. Future research should focus on validity and the reliability in representative samples, which are large enough to control for the demographic variables mentioned above. Ideally, this could be done in a European consortium. Important aspects to investigate in this respect concern *convergent* validity (e.g. using the Vineland Adaptive Behavior Scale, cf. La Malfa *et al.*, 2009 or other instruments to assess emotional development, such as the FEAS, ITSEA, the Frankish tool or ESSEON-R, cf. *supra*) and *divergent* validity. The latter could focus on the assessment of the prevalence of challenging behaviour about which a negative relationship with emotional development can be assumed. Challenging behaviour could be assessed by the Questions About Behavioral Functioning Scale (QABF; Vollmer and Matson 1999) or other valid and reliable assessment instruments and approaches (see Lloyd and Kennedy 2014). The present endeavours could also be expanded into a

study that focuses not only on support, but also on the prevention of challenging behaviour by assessing and taking into account the emotional development of people with ID.

To conclude, this paper provides a description of the SED-R and, even more importantly, reports on several universal quality indicators related to scale development and scale application. With regard to robustness, the SED-R has a high internal consistency and shows substantial inter-rater reliability, albeit not for all domains. More research on the psychometric properties is definitely needed, and the present study could be regarded as a first phase in a more long-term process. Concerning the aspect of utility, the SED-R may be regarded as an adequate tool to integrate information about emotional development in assessment and support planning processes. The third point relates to understanding: since assessment is carried out in close cooperation and dialogue with caregivers and family members, the focus is on reflection, which – in itself – could be regarded as supportive for the client and his context. We are – indeed – obligated to initiate ‘real’ dialogue about how all of the stakeholders (caregivers, family, ...) perceive a client’s behaviour. This exchange of thoughts and ideas may not only strengthen the bond between different parties in the support process, but it may also generate ‘new’ knowledge and practice based on different perspectives. With regard to relevance, the application of the SED-R in a proper and sound way, broadens our view and stimulates us to think beyond labels and diagnoses by placing (more) emphasis on contextualizing human behaviour.

Disclaimer Statements

Contributors All the authors mentioned have contributed to the paper as an author. Stijn Vandeveldt, Filip Morisse, Anton Dosen, Leen Poppe, and Claudia Claes have been involved in the design of study, the data analysis and the drafting of the paper. Bea Jonckheere has been involved in the design of the study, the data collection and the drafting of the paper. Geert Van Hove and Bea Maes have been involved in the design of the study and the drafting of the paper. Jos van Loon has been involved in the drafting and revising of the paper.

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Conflicts of interest There are no conflicts of interest.

Ethics approval The study was set up in accordance with the ethical regulations of the General Ethical Protocol of the Faculty of Psychology and Educational Sciences at Ghent University. After consulting with the head of the Ethical Committee, no formal application for ethical approval was submitted as this was felt to be unnecessary (the

study followed the ethical regulations of the Ethical Protocol and the study only analysed data that were completely made anonymous for the researchers – cf. infra). Informed consent from the informants was obtained and all data were registered and analyzed anonymously. The anonymous data files were only accessible for the researchers. The SED-R scale that was administered in the service was kept in the client’s personal support file (stored in the treatment service) as the individual results are an integral part of the clients’ global assessment and treatment plan.

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