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**An Observational Measure of Empathy for Autism Spectrum:
A Preliminary Study of the Development and Reliability of the Client Emotional
Processing Scale**

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ABSTRACT:

People with Autism spectrum disorder (ASD), can have difficulties in emotion processing, including recognising their own and others' emotions, leading to problems in emotion regulation and interpersonal relating. This study reports the development and piloting of the Client Emotional Processing Scale – Autism Spectrum (CEPS-AS), a new observer measure of four interrelated aspect of emotional processing: emotion recognition, self-reflection, cognitive empathy, and affective empathy. Results showed good interrater reliability (alpha: .69 to .91), while inter-dimension associations were high ($r = .66-.82$). The measure was able to detect significant differences on the four dimensions across a short-term Humanistic-Experiential group therapy. The CEPS-AS shows promise as a potential addition to current self-report instruments measuring empathy or emotion processes in individuals with ASD.

Keywords: Emotional Processing, Empathy, Autism Spectrum, Observer Measure.

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Autism Spectrum Disorder (ASD) is primarily defined in behavioural terms based on social communication and restricted, repetitive and stereotyped behaviour (American Psychiatric Association, 2013). However, difficulty identifying and processing emotion remains a key diagnostic feature and impairments in emotion recognition for individuals with autism are well established, although not fully understood (Uljarevic & Hamilton, 2013). For example, people with autism lack accuracy in recognising emotions (Baron-Cohen, et al., 2001; Golan, Baron-Cohen, & Golan, 2008). Furthermore, emotion recognition is viewed as the first step to empathy, which is fundamental to the development of relationships and, people on the autism spectrum have also been described as having an empathy disorder (Gillberg, 1992).

Over the past several decades there has been growing recognition of the critical role of emotion in human functioning (Ekman & Davidson, 1994; Frijda, 1986; Lazarus, 1991). Psychotherapists and psychotherapy researchers in particular have increasingly acknowledged the importance of emotion. For example, there is growing support for adapted versions of cognitive-behavioural therapy (CBT) to treat comorbid symptoms of depression and anxiety in people with ASD (Cardaciotto & Herbert, 2004; Weiss & Lunsky, 2010), by assessing thoughts and feelings (Beck, 1993). There has also been a recent focus on Mindfulness-Based Therapy (MBT), in which people are taught experiential exercises in order to first identify phenomena occurring in the present moment (e.g., bodily sensations, thoughts, feelings) and then to accept them just as they appear without the need to analyse or change (Kabat-Zinn, 1982). It can be argued, however, that these approaches do not address social and emotional cognition and empathy (Target & Fonagy, 2006).

An emerging alternative in typical development (TD) psychotherapy that does address these processes is humanistic-experiential psychotherapy (HEP), with a large and diverse general evidence base (Elliott et al., 2013). The most central characteristic of HEP is its focus on promoting experiencing and self-empathy within therapy (e.g., Rogers, 1961). Similarly, HEP researchers study how clients change in psychotherapy through identifying, describing and modelling the key underlying processes in typical development (TD) clients (Greenberg, 1986), using process research methods to do so. Thus, as applied to ASD, adapted HEPs can address many core areas of difficulty for those with ASD: ultimately difficulties in emotional processing, self-experiencing, empathy and interpersonal relating.

If we recognise the need for therapeutic intervention in areas of emotion regulation, self and empathy for the ASD population, then we also need to be able to track changes in these processes across psychotherapy. As the ASD population has been largely neglected in general psychotherapy research there is a paucity of specific instruments to track changes. Thus, we propose a shift towards measuring emotional and empathy processes across treatment. Currently, however, process measures used to track experiential processing in TD psychotherapy are not adapted for people with ASD. There are thus limited instruments available to psychotherapists or researchers wishing to measure movement across psychotherapy for social-emotional processing differences in ASD.

A key complication is the heterogeneity of empathy measures that have been applied with TD populations (e.g., Gladstein et al., 1987; Ickes, 1997), including the commonly drawn distinction between cognitive and emotional components (Preston & de Waal, 2002). In order to develop a measure that is suitable for tracking change across psychotherapy for ASD, it is important to consider two relevant research literatures: (a) ASD and non-ASD population empathy self-report measures (e.g., Baron-Cohen & Wheelwright, 2004; Hogan, 1969); and (b) humanistic-experiential process measures, also for non-ASD populations (e.g., Kiesler, Klein & Mathieu, 1965).

The first of these literatures relies on self-report measures for assessing empathy in TD populations. There are many such empathy self-report measures purporting to measure empathy, such as the Chapin Social Insight Test (Chapin, 1942), the Empathy (EM) Scale (Hogan, 1969), the Questionnaire Measure of Emotional Empathy (QMEE; Mehrabian & Epstein, 1972), and the Interpersonal Reactivity Index (IRI; Davis, 1983). Each of these self-report measures have been criticised for either measuring limited components of empathy or for focusing too broadly on a range of social skill domains (Baron-Cohen & Wheelwright, 2004).

Of these, Baron-Cohen and Wheelwright (2004) considered the IRI the best measure of empathy, yet still criticised it for measuring processes broader than empathy. For this reason they developed the Empathy Quotient (EQ; Baron-Cohen & Wheelwright, 2004), which is the only current instrument that specifically focuses on individuals with an apparent empathy deficit. Empathy self-reports such as the EQ provide a baseline for how the person with ASD may perceive their empathy skills; however, completing the EQ in itself requires a depth of self-awareness that may be hard to achieve for individuals in the ASD population, who have been described as lacking a sense of self (Hobson, 2002).

This points to a second approach to assessing empathy in the ASD population: process observation. A promising TD concept that can be measured observationally is *experiencing*, which is central to the theory of change in HEPs and an important process variable investigated within TD populations in psychotherapy. Experiencing, refers generally to turning attention to internal experiences, clarifying those experiences and discovering new emotional meanings (Hendricks, 2002). The Client Experiencing Scale (CEXP; Klien, Mathieu, Gendlin & Kiesler, 1969) was developed as a readily measureable observation instrument to assess the degree to which a client communicates their immediate, in-session experiencing. This seven point scale describes varying levels of experiencing and emphasizes the shift from external focus to inward experiencing. CEXP (Kiesler, Klein & Mathieu, 1965) is the most widely used observation measure of client process in the TD psychotherapy research field (see reviews by Hendricks, 2002; Yeryomenko & Pascual-Leone, 2013), and has been used in numerous studies as a research tool to track shifts across therapy or even within single interview sessions. However, CEXP does not directly or explicitly measure empathy, while existing observer empathy measures such as the Accurate Empathy scale (AE; Truax & Carkhuff, 1967) focus exclusively on therapist empathy and do not address self-empathy or emotional processing more broadly.

In view of the absence of an appropriate observer measure for the central process of emotion regulation and empathic processing in people with ASD, we developed the Client Emotional Processing Scale–Autism Spectrum (CEPS-AS). In the present pilot study we focused on the construction, piloting and assessment of the reliability of the CEPS-AS. This study explored the extent to which a measure of client emotion and empathy process could be developed to assess cognitive-affective

components of emotional processing, including both self- and other-empathy. Specifically, we looked at: (a) whether raters could attain adequate inter-reliability on the CEPS-AS and its component dimensions; (b) whether the 4 component dimensions of the CEPS-AS are internally consistent with one another; (c) whether CEPS-AS is sensitive to change over the course of a new HEP intervention for ASD.

METHOD

Measure Development and Piloting

Participants

Clients: The participants were recruited from Scottish Autism, a national autism organisation that provides education and adult services throughout Scotland for all ages and across the spectrum. The participants were adults and adolescents diagnosed with Asperger Syndrome by a psychiatrist or appropriate clinician (e.g. clinical psychologist) using DSM-IV criteria (APA, 2000). Although formal diagnostic testing was not carried out for this pilot study, confirmation of diagnosis for all participants was obtained from the specialist Autism Spectrum Disorder Diagnostic Team. Three adults (mean age = 39.7) and three adolescents (mean age = 14.0) were included in the study after self-referral (by the adults) or social-worker referral (for the adolescents) in response to advertisements for a research study. The adult group consisted of one female (43 years) and two males (37 and 39 years). All adults had completed mainstream secondary education; the female had accessed a Further Education College and both males had attended University. The adolescent group consisted of two females (14 and 15 years) and one male (13 years) all currently within secondary mainstream education. All participants gave informed written consent, with additional written parental consent for the adolescent participants, based on a research protocol approved by the university ethics committee.

Researcher/Practitioner: The therapist was the first author; her orientation was Person-Centred/Experiential with additional training in Emotion Focused Therapy.

Rater Test: The rater was a BPhil graduate in Autism and had over 20 years direct experience of working with young children with an ASD and their parents/carers.

EFT-AS: The first author delivered two groups, consisting of an adolescent group (n=3) and adult group (n=3) of a nine-week modified group Emotion Focused Therapy protocol for Autism Spectrum (EFT- AS) reported in a larger study (EFT-AS; BLINDED, 2014). All sessions were video recorded. The first session (T1) was a one-hour of regular (open discussion of life experiences and current difficulties) therapy session. The first author conducted a micro-analysis of the video recording to extract 3 edited video segments for video replay in the following session, using Interpersonal Process Recall (IPR; Kagan, 1984). The conceptual framework for emotional processing guided the microanalysis and segment selection was drawn from literature of cognitive and affective theories of autism (see Table 1). This sequence of *regular therapy* followed by *IPR therapy session* was repeated four times in a cycle through weeks 3-8 with a final ending session in the ninth week.

Conceptual Framework: As a conceptual framework for guiding the construction of an observational instrument for assessing the dimensions and levels, the first author drew on three sources: (a) the 2X2 model of types of emotional processing/empathy difficulties (Table 1); (b) the Walker-Rablen-Rogers Process

Continuum (1960) and its successor the Client Experiencing Scale (CEXP) (Klien et al., 1969); and (c) her own extensive experience with the ASD population.

Procedure

Measure Construction. The first author conducted an initial analysis looking at video recordings of client in-session performances for evidence of social and emotion processing difficulties, using the theoretical framework in Table 1 as a guide to organize her observations. This was followed by an in-depth textual analysis: The first regular group therapy session and the final video playback/recall session were transcribed. Using discourse analytic methods, each therapy session transcript was examined qualitatively to identify and describe markers of emotional processing performance. The resulting 306 performance markers were organized within each of the emotional processing domains and codified via an open coding process. The first domain, *emotion processing*, contained 77 performance markers; the second domain, *empathy processing*, contained 49 performance markers; the third domain, *self-reflective processing*, contained 86 performance markers and the fourth domain, *mental representation processing*, contained 94 performance markers. Using the constant comparative method (Glaser & Strauss, 1967) open coding was carried out on the performance markers contained within each of the four domains. These performance markers were clustered into 5 graded categories across a continuum of processing in each of the four emotional processing domains. The first and second authors then met regularly to discuss the experiencing dimensions, video segments and text and revised these until agreement for the final CEPS-AS was achieved.

Instrument. The instrument we arrived at consisted of four emotional processing dimensions: (a) Emotion encoding and symbolizing, (b) Self-Reflective Processing, (c) Empathy and (d) Mental Representation, each represented by 5 ordered levels (see Appendix 1). These four dimensions represent the qualitatively different aspects of general cognitive-affective processing style in ASD (for an illustration of each level see Appendix 2). (A coding manual is available from the first author and describes each level within each dimension, providing definitions and illustrative examples of client behaviours, together with a coding form).

The CEPS-AS was used to rate client performance by the first author and an independent rater who had extensive ASD experience. The independent rater attended two training sessions on the CEPS-AS, using practice video material from other sessions not rated in the final analysis.

Coding Procedure. Each rater independently rated 42 4-minute segments of video footage, consisting seven segments each from the first regular group therapy session (used as a pre-test, T1), the first video playback/recall session (session 2, T2), and the final video playback/recall session (session 8, T8), for both adult and adolescent groups. Instead of doing global ratings on the four CEPS-AS dimensions, raters used partial interval sampling (Bakeman & Gottman, 1997) by coding the presence ("1") or absence ("0") of behavioural indicators of each of the 5 ordered levels within each of the four CEPS-AS dimensions. These indicators were then averaged to come up with a mean indicator value for each segment. Each 4-minute video segment was rated 12 times (3 clients X 4 dimensions) by each rater. These segment mean indicator values were used for the reliability analyses. Interrater reliability was calculated for both individual raters (Pearson r) reliability and cross-judge averaged data (Cronbach alpha).

Summarizing Procedure. For overall session-by-session comparison of client performances, segments were summarized by averaging first across raters ($n = 2$), then across segments within sessions ($n = 7$) and finally across clients ($n = 6$).

RESULTS

Testing of the CEPS-AS

Judgement of Rateability. In effect, raters first had to decide whether a 4-min segment contained behavioural indicators for each of the 4 dimensions. The interrater reliabilities of these presence-absence judgements are presented in Table 2, and were quite high for overall ratings averaged across dimensions, with an alpha reliability of .84 for judgements combined across the two raters. The alpha reliabilities for rateability judgements on the individual dimensions, for ratings averaged across raters, varied from .75 to .93, indicating consistently good to excellent interrater reliability; reliabilities for ratings done by single raters (Pearson correlations) were somewhat lower.

Interrater Reliability. Interrater reliabilities for processing dimension ratings combined across raters (Cronbach alphas) varied from .69 (Emotion Regulation) to .91 (Mental Representation); interrater reliability for ratings averaged across the four dimensions was .91 (see Table 2); again, ratings by single ratings (correlations) were somewhat lower, varying from .54 (Emotion Regulation) to .84 (Mental Representation). This indicates that two raters were sufficient for this rating task, and single raters might be sufficient for rating Empathy, Self-reflection, Mental Representation and combined ratings (but not Emotion Regulation).

Inter-dimension Reliability. Inter-dimension correlations were analysed for both raters (Pearson correlations) across the four processing dimensions (see Table 2). All four dimensions were significantly correlated with each other; this varied from .66 ($p < 0.01$; empathy and self-reflection) to .82 ($p < 0.01$; self-reflection and mental-representation). The overall inter-dimension reliability statistic for ratings averaged across dimensions (Cronbach alpha) was .91. These point to a high degree of overlap, indicating that the four items of the CEPS-AS are not in fact independent dimensions but rather closely interwoven components of emotional processing.

CEPS-AS Sensitivity to Processing Change Across Treatment

The CEPS-AS was developed to be used as a measure for tracking emotional processing change across treatment, so it was important to assess sensitivity to change. Therefore, we compared scores from three time points across a nine-week Emotion Focused Therapy-Autism Spectrum (EFT-AS) treatment, using a repeated measures ANOVA for overall emotional processing and for each of the four processing dimensions, as reported in Table 3.

Overall Emotional processing: The repeated measures ANOVA showed that, for the six clients, change in overall emotional processing over sessions was statistically significant ($F = 32.32$; d.f. = 2,9; $p < .01$) and indicated large differences overall among sessions 1 (T1: baseline), sessions 2 (T2: first video playback/recall session) and sessions 8 (T8: last video playback/recall session).

Emotional processing dimensions: The repeated measure ANOVAs were highly significant for each of the four processing dimensions: Emotion Regulation ($F = 32.70$; d.f. 2,7; $p = .01$); Empathy ($F = 50.45$; d.f. 2,9; $p = .01$); Self-Reflection ($F = 12.83$; d.f. 2,11; $p = .01$); Mental Representation ($F = 34.50$; d.f. 2,12; $p = .01$), indicating highly statistically significant differences across sessions.

We also carried out exploratory analyses to assess possible age/group and gender effects. We found no evidence for age/group differences; however, female

participants seemed to show substantially larger pre-post change than male clients, even though this was not statistically significant, probably because of the small sample.

DISCUSSION

In this study we have reported on the construction and initial validation of the Client Emotional Processing Scale-Autism Spectrum (CEPS-AS), a new observer measure for assessing changes in emotional processing across an intervention aimed at helping participants develop better self- and other-empathy at both affective and cognitive levels. To our knowledge this is the first reported observer measure for emotional processing using a cognitive-affective self-other dimensional framework. Its affective-empathy dimensions encompass self-regulatory emotion and empathic processing while the cognitive-empathy dimensions include self-reflective and mental representation processing. This is in line with theoretical accounts of the social-emotional processing differences in autism (Chervallier et al., 2012; Loveland, 2001; Baron-Cohen, 2005; Hobson, 1993).

Our results showed a high degree of interater reliability in identifying the presence or absence of performance markers for the four emotional processing dimensions from experienced autism practitioners. Furthermore, there was a moderate to high degree of interater reliability for discriminating experiential levels across each of these dimensions. Individually, single raters were able to achieve high enough reliabilities in identifying three out of the four processing dimensions, with emotion processing requiring both raters. The results indicate that the CEPS-AS may be a useful clinical tool for therapists to monitor change during therapy. The interdimensional reliability results also suggest that the four processing dimensions overlap substantially with each other, pointing to the possibility of shorter forms of the instrument or even extracting one or two dimensions to make it easier for raters to use the instrument. Moreover, the CEPS-AS has the potential to discriminate observable changes over the course of treatment. One implication is that this could be a useful observation tool for clinical trials research on both experiential and cognitive-behavioural therapies.

In our analyses we attempted to separate the effects of modality (regular vs IPR sessions) from the overall pre-post differences. Our modality findings (sessions 1 vs. 2) suggested that the CEPS-AS was capable of discriminating between client performances in regular vs video playback group sessions. The modality difference was largest for cognitive empathy (mental-representation) and affective empathy (empathic relating) to other. In addition, we also showed that CEPS-AS could discriminate client emotional processing levels over time in the video playback modality (sessions 2 vs 8) for each of the components of empathy, with the largest difference in cognitive empathy for others.

Research on the neurobiology of empathy points to the existence of three primary brain components of empathy (Decety & Hodges, 2006; Preston & de Wall, 2002): first, an affective response to another person, involving sharing or resonating with that person's emotional state; second the cognitive capacity to take the perspective of the other person; and third a self-regulatory mechanism that modulates inner states. The self-regulatory mechanism involves emotion-regulation to reappraise or soothe personal distress at another person's pain or discomfort. On our data the CEPS-AS discriminated between at least four stages of empathy: First, in 'misempathy', the emotional experiences or intentions of the other were missed; then participants developed a conceptual understanding of how they missed empathic

responding; next, recognising or feeling moments of affective contact emerged; finally, having activated an emotional, limbic response to the emotions of the other, participants reached the stage of being compassionately moved and wanting to respond to the emotional needs of the other.

Although time-consuming to carry out, our results showed a high degree of interrater reliability in identifying performance markers and discriminating levels of functioning for the four emotional processing dimensions. We acknowledge that these results are preliminary and may not generalise between the raters involved (one being the first author); clearly additional research is required. Nevertheless, single raters may be able to achieve adequate reliabilities in identifying three out of the four processing dimensions, with emotion processing requiring both raters. However, two raters are recommended at this preliminary stage.

As this is the first presentation of the Client Emotion Processing Scale for Autism Spectrum (CEPS-AS) developed from a modified group Emotion Focused Therapy (EFT-AS) the study has a number of limitations. One such limitation can be seen as the circularity of developing a measure based on the discourse and performances of clients going through treatment that focuses on those core areas of deficit. Possible researcher bias from the involvement of the first author in the construction and rating of the CEPS-AS must be acknowledged. Further, the measure is based on data from only six clients evaluated by two raters and thus is too preliminary to make more than tentative claims of reliability or validity. Nevertheless, it shows potential that requires further testing. The language used to construct the four dimensions was grounded in qualitative data from a small sample of people with a clinical diagnosis of Asperger Syndrome, who as such possessed high cognitive and language ability. It is not possible to generalize the CEPS-AS usefulness for the broader ASD population with below average cognitive and language capabilities. In fact, the CEPS-AS is based upon the quality of client discourse and interpersonal shifts and therefore may be of little use to those who have limited language. However, it is our claim that people with an autism spectrum difficulty seeking psychotherapy or counselling intervention are usually those with a high cognitive and language profile.

A further limitation of the present study is that we lack measures to assess cognitive functioning, language ability, level of ASD symptom severity and associate emotional and behavioural problems. In our study we used the initial presentation as a baseline assessment and any future study would require adequate assessment to profile skills in cognitive, verbal and emotional IQ to permit any generalization to the broader ASD population. In addition, no other measures were used to track client change or to evaluate convergent or discriminant validity, for example, by assessing empathy self-report, psychological distress, interpersonal functioning or verbal IQ. An important next step will be to test the validity of the CEPS-AS subscales against existing empathy self-report measures and performance-based measures such as the Revised Eyes Test (Baron-Cohen et al., 2001).

Further, the design of the study may not have allowed for adequate investigation of effects of treatment modality and any future studies should focus on the effect of modality (cycles of regular vs IPR) across treatment. Interestingly, exploratory analyses found few if any differences between adult and adolescent clients, pointing to the possibility that CEPS-AS could be useful for both populations. However, although our study was not designed to assess efficacy of treatment, we found intriguing indications that female clients showed greater amounts of pre-post change than male clients.

Psychotherapy researchers have recognised the limitation of excessive reliance on self-report measures (Spek et al., 2013) and there have been calls for a broader range of measures. The CEPS-AS could potentially fill this gap. However, observer measures are often time intensive as they require training for administering the instrument, to develop a consensus agreement of performance markers followed by independent viewing of segments to make judgment scores. The present study used experienced autism practitioners as raters. Future studies should assess the level of training required for naïve rates to gain adequate inter-rater reliabilities.

A final issue emerging from the present study is the high inter-dimension correlations obtained, which indicate redundancy among the dimensions. It may be that the cognitive-affective components contained within the CEPS-AS are so closely related that they are not distinct constructs but instead may be overlapping components of the same construct. While this may be the case, we advocate further and extended replication studies before dropping one or more of the four dimensions or collapsing subscales of the CEPS-AS. This would inform the best means of reducing the items, which would make the measure easier to apply, and less time intensive.

Currently empathy is predominantly measured through self-report instruments that focus on typical development (TD) empathy processes. The Empathy Quotient (Baron-Cohen & Wheelwright, 2004) is the exception and measures empathy deficits displayed by people with AS. We recognize the value of such an adapted EQ self-report instrument, but argue that a limitation of such measures of empathy is that they rely on the subjective view of the person with ASD. The CEPS-AS provides researchers with the potential to triangulate self-report and observer measures in order to provide more robust and valid assessment of these different perspectives. In spite of the limitations noted above, it is our view that the data reported here indicate that the CEPS-AS is a promising new observer instrument for assessing and tracking client emotion processing and empathy over the course of treatment.

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Table 1: Conceptual Framework for the CEPS-AS

	SELF	OTHER
Affective empathy	Emotional self-attunement (Processing own emotions)	Interpersonal attunement (Empathic relating)
Cognitive Empathy	Self-understanding (theory of own mind) (Self-reflection and conception)	Other awareness (theory of your mind) (Mental representation)

Table 2: Inter-rater Reliabilities and Inter-Dimension Correlations for the CEPS-AS

	Rateability		Dimensional Ratings		Inter-dimension Correlations		
	Individual Ratings (r)	Combined Ratings (alpha)	Individual Ratings (r)	Combined Ratings (alpha)	Empathy	Self-Reflection	Mental-Representation
Emotion Regulation	.77	.87	.53	.69	.69	.73	.71
Empathy	.61	.75	.80	.88		.66	.75
Self-reflection	.77	.87	.75	.85			.82
Mental Representation	.88	.93	.84	.91			
Mean Ratings	.95	.84	.83	.90			

Note. All inter-dimension correlations significant $p < 0.01$; $n = 82 - 90$. Interrater reliabilities used Cronbach's alpha for 2 raters (equivalent to ICC 2,2).

Table 3: CEPS-AS Ratings Across Sessions

CEPS-AS Dimension	T1		T2		T3		<i>F</i>
	M	SD	M	SD	M	SD	
Emotion	1.48	0.19	2.25	0.37	3.31	0.53	32.70 (d.f.: 2, 7)
Empathy	1.57	0.35	2.24	0.32	3.25	0.25	50.45 (d.f. 2, 9)
Self-Ref	1.53	0.56	2.48	0.32)	3.29	0.66	12.83 (d.f. 2, 11)
Mental Rep	1.43	0.38	2.37	0.58	3.77	0.58	34.50 (d.f. 2, 12)
Overall	1.53	0.44	2.33	0.33	3.44	0.40	32.32 (d.f. 2, 9)

Note. All *F* tests were significant at $p < .01$

Appendix 1: Client Emotional Processing Scale-Autism Spectrum

Part 1: AS-EMOTION REGULATION (ENCODING AND SYMBOLIZING)

subscale

ER1: <i>Absence of emotional experience</i>	The client's dialogue is expressed as descriptive accounts of experiences, which are relayed, but are devoid of reference to feelings experienced by self or for the feelings of others. The client's dialogue indicates an inability to locate internal bodily sensations
ER2: <i>Externalized emotional experiences</i>	The client displays nonverbal emotion, although these displays of affect are not anchored in awareness. The client's narrative demonstrates a lack of synthesis between the bodily sensation and verbally expressed emotion. The client's emotion dialogue is externalised.
ER3: <i>Disregulation of emotion experiences</i>	The client's dialogue involves discontinuity between emotional intentions and how their behaviour or emotions are perceived interpersonally. The client's emotion dialogue is evident, but is limited to descriptions of extreme emotion states or experiences of emotional outbursts or meltdowns.
ER4: <i>Internally located and encoded experiences</i>	The client's dialogue reflects a more internal focus of emotion experiencing. The client's dialogue demonstrates a connection between sensing internal bodily sensations with an expanded repertoire of verbal expressions through sensing own emotions, labelling own emotion and the emotions of others.
ER5: <i>Interpersonal awareness of emotion</i>	The client's dialogue reflects experiences from an internal felt referent or as expressions of internal sensations. The client's dialogue demonstrates emotional reciprocity through recognition that they have symbolized the emotions of others and that they have encoded and been affected by the emotions of others.

Part 2: AS-EMPATHY subscale

E1: <i>Lacks empathic attunement</i>	The client's dialogue reflects an internal focus on own narrative and presents as being self-absorbed. The client's dialogue is void of accurate empathic attunement when relaying descriptive accounts of interpersonal exchanges and lacks empathic attunement when relaying interpersonal experiences. The client's engagement to others' pain or discomfort is not met with an empathic response.
E2: <i>Oriented towards others</i>	The client's dialogue demonstrates a shift towards interpersonal relating, with attempts at empathic responding to others through offering empathic conjectures in response to others, but these are not synchronised or attuned to the other's felt sense or expressed feelings. The client's empathic conjectures take the form of cognitive formulations and others' empathic conjectures are rejected.
E3: <i>Sharing of affect</i>	The client's dialogue demonstrates interpersonal engagement leading to psychological connection. The client engages in shared interplay of affect and a sharing of empathic attunement. The empathic conjectures from others are met with attempts to see if they resonate or lead to a sense of 'fit'.

E4: <i>Accurate sensing of the other</i>	The client's dialogue reflects a shift towards an accurate sensing of others with a shared entering of experience, which leads to accurate empathic conjectures resulting in accurate empathic attunement. They demonstrate an awareness of their ability to move others emotionally and understanding that others may require soothing (emotional comfort).
E5: <i>Mobilised into action towards emotion of other</i>	The client's dialogue reflects a qualitative shift in the strength of empathic resonance, which mobilises them into action to respond to others' pain. The client demonstrates a strong emotional response to others' discomfort, feelings, along with a need to take action to alleviate others' pain.

Part 3: AS-SELF-REFLECTIVE PROCESSING subscale

SR1: <i>Absence of self with scripted quality</i>	The client's dialogue reflects their narrowly focused interest with little reference to self, whilst recounting trauma and painful experience has a scripted quality. The client's self-schemas are anchored in an AS identity, which is relayed through global AS descriptions.
SR2: <i>Self is through AS deficit</i>	The client's dialogue reflects an understanding of the impact of AS through comparative accounts of AS and NT differences. The client's dialogue demonstrates descriptive accounts of self from an internal locus, but from a deficit capacity referent. There is an appreciation of own therapeutic focus.
SR3: <i>Self-awareness has present quality</i>	The client's dialogue reflects a here-and-now awareness of reflecting on self. The client's dialogue demonstrates new awareness that is reflected within perceptual and sensory processing accounts.
SR4: <i>Self-and-other insights</i>	The client's dialogue reflects new self-insights, which demonstrate an interpersonal referent with self as an active agent. The client's dialogue demonstrates an action tendency and a desire for self- change.
SR5: <i>A fluid, complex self</i>	The client's dialogue reflects introspection with an awareness of the complexity of self and of the multiplicity of self. The client's dialogue demonstrates an understanding of self-schemes and how these operate within self and with affirmations that change has occurred.

Part 4: AS-MENTAL REPRESENTATION subscale

MR1: <i>Projects own thoughts onto others</i>	The client's dialogue reflects a lack of joint shared referencing and is dominated by one-sided descriptions of own experience with little apparent need for reciprocal exchanges. The client demonstrates an interpretation from an egocentric frame of reference that misses the intentions or implied meanings of others.
MR2: <i>Awareness separate mental representations</i>	The client's dialogue reflects a differentiation of own mental representations being separate from the mental representations of others, with an appreciation of other's mental representations being different to their own, but there is recognition of an inability to imagine the thoughts

MR3: <i>Can manipulate and change own mental representations</i>	of the other. The client demonstrates a lack of awareness of impact of own implicit meanings on others, but makes mental representation conjectures towards others The client's dialogue reflects a shift towards flexibility in manipulating own mental representations. The client offers their own thoughts as speculative and open to exploration and changing their own mental representations.
MR4: <i>Emergence of metacognitive</i>	The client's dialogue reflects the emergence of metacognitive processing through awareness that their own and others' mental representations have been misinterpreted. The client acknowledges misunderstanding of own mental representations by others and the misinterpretation of others' mental representations is recognised.
MR5: <i>Considers metacognitive thinking</i>	The client's dialogue reflects a qualitative shift that displays engagement in metacognitive thinking, demonstrating consideration of mental processing of others with an appreciation that others have intentions that have an interpersonal impact. The client demonstrates that they can engage in imagining others' thoughts and an appreciation that others have mental representations of them.

Appendix 2: Client Illustrations of the Client Emotional Processing Scale-Autism

Part 1: AS-EMOTION REGULATION (ENCODING AND SYMBOLIZING) subscale	
ER1: Absence of emotional experience	Carla: [pause] No, [cant describe what it feels like to be stressed] because it hasn't happened for a few days. It's hard because I haven't been stressed for days. Because I've had my friend over for a few days, no I can't, it's hard
ER2: Externalized emotional experiences	Martin: I'm quite quiet, I'm not enthusiastic, I don't use any hand signals. Maybe if I used hand signals it would show me being more enthusiastic"
ER3: Disregulation of emotion experiences	James "For example I completely lost it doing a session in the library yesterday..."
ER4: Internally located and encoded experiences	Natalie "now I'm angry with myself with that whole clip! It didn't turn out right and I'm angry for saying that because it was inappropriate" [moans and puts head down on knees]
ER5: Interpersonal awareness of emotion	Martin: I felt ashamed [Therapist: Ashamed] "Just because of the way I feel, about them, the way I feel, yeah"
Part 2: AS-EMPATHY subscale	
E1: Lacks empathic attunement	Martin shares his experience of loneliness Carla "What University was it?"
E2: Oriented towards others	Martin shares his hurtful experiences of not making new relationships at University Carla "Do you tell people that you've got Asperger's?" Martin..."No, I was only diagnosed a couple of years ago"
E3: Sharing of affect	Matt turns and Carla turns towards each other, they hold each others gaze and smile at each other
E4: Accurate sensing of the other	Carla "...I get angry because I can feel for you, [Martin] right and I can understand your frustrations and angers..."
E5: Mobilised into action towards emotion of other	Natalie "I just want to stop Jane from being scared"
Part 3: AS-SELF-REFLECTIVE PROCESSING subscale	
S-R1: Absence of self with scripted quality	Carla "... It's their interpretation. It's not my fault, if you can't interpret me..."
S-R2: Self is through AS deficit	Natalie "Yeah, I can't speak to people because I'm always like, because I don't think I'll be accepted because I'm so weird"
S-R3: Self-awareness has present quality	Carla "...I can actually [makes roar sound and clenches her hands] you know what that is about, that's it dawning on me..."
S-R4: Self-and-other insights	Natalie "I was throwing that at the screen because I'm not happy with myself for saying that and I can see that that's inappropriate now..."
S-R5: A fluid, complex self	Natalie "...I thought I was, I don't think I'm so strange now, because people like me and I thought I don't really like people because they've always been mean to me because I've been so weird... And I'm wondering is that actually true? I am different but people don't seem to hate me for it"
Part 4: AS-MENTAL REPRESENTATION subscale	
MR1: Projects own thoughts onto others	Therapist "How does that make you feel Martin?" Carla "Scary, makes you feel scared doesn't it"
MR2: Awareness separate mental representations	Carla "... You were more relaxed and when you were talking about the incident that went on at work in the first clip, he was so tensed up about it..."
MR3: Can	Natalie "...And I'm wondering is that actually true? I am different

<i>manipulate and change own mental representations</i>	<i>but people don't seem to hate me for it"</i>
MR4: Emergence of metacognitive	<i>Carla "I can sit here and I can understand how your family is or how your Mum might feel; I'm on the other side of the coin from your Mum..."</i>
MR5: Considers metacognitive thinking	<i>Carla: "I got the impression, you mentioned your dad and I got the impression that you were angry at him for what appeared, it came across as if he was blaming you for the things that you'd done and it was your fault that you were being bullied and you were angry about that"</i>