COPING WITH PROBLEMS IN SOCIAL INTERACTION IN ASPERGER'S SYNDROME: AN INVESTIGATION OF PERSONS WITH HIGHER EDUCATION

Master's thesis
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ABSTRACT

Coping with Problems in Social Interaction in Asperger's Syndrome: An Investigation of Persons with Higher Education

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This study investigated the social interaction problems of six persons with Asperger's Syndrome (AS) and higher education, and coping with the problems. There are very few previous studies on the subject. The significance of the participants' strengths and of the diagnosis in coping with the problems was also examined. The data was collected by WAIS-III battery, self-report forms (RSE, CISS, WCQ) and thematic interview.

According to WAIS battery, almost all participants were well above average in terms of their cognitive performance, with the verbal component being higher than the performance component in most cases. The participants had faced many problems in social interaction. Of these, communicational problems, problems in social situations and social relationships were central. The participants had found several strategies for coping with the problems. On the basis of the self-report forms, task-oriented/focused strategies were the most important strategy group. By and large, there were no differences in the relative use of strategies between the participants and comparison group. In addition to active, task-oriented/focused strategies, the interview data revealed strategies involving others, avoidance- and control-focused strategies as central strategy groups. Resources of thinking and general linguistic talents were important strengths. The effects of the diagnosis have been mainly positive, although some difficulties have also been encountered by the participants.

Four of the six participants being female, this study sheds light on the situation of AS females, who are a minority in the AS population. Small sample size and the narrowness of the sample can be regarded as weaknesses. Further studies should include wider samples with participants functioning in different levels. The results can be applied to AS rehabilitation, especially to the assessment of coping strategies, adjustment training and AS peer groups.

Keywords: Asperger's syndrome, Asperger syndrome, social interaction, cognitive abilities, coping, diagnosis, strengths

TIIVISTELMÄ

Asperger-henkilöiden selviäminen sosiaalisen vuorovaikutuksen ongelmien kanssa: tutkimus korkeakouluopintoja suorittaneista henkilöistä

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Tutkimuksessa selvitettiin Aspergerin syndrooman (AS) sosiaalisen vuorovaikutuksen ongelmia ja niiden kanssa selviämistä kuudella korkeakouluopintoja suorittaneilla aspergerhenkilöllä. Aiheesta on hyvin vähän aikaisempia tutkimuksia. Lisäksi tutkittiin vahvuuksien ja diagnoosin merkitystä selviämisessä. Aineisto kerättiin WAIS III –testistöä, kyselylomakkeita (RSE, CISS, WCQ) ja teemahaastattelua käyttämällä.

Lähes kaikki osallistujat olivat WAIS -testistön mukaan kognitiiviselta suoritustasoltaan selvästi yli keskitason kielellisen osan ollessa pääosin suoritusosaa korkeampi. Tutkimuksessa selvisi, että osallistujat ovat kohdanneet monenlaisia ongelmia sosiaalisessa vuorovaikutuksessa. Päällimmäisiksi nousivat viestinnälliset, sosiaalisten tilanteiden ja sosiaalisten suhteiden ongelmat. Osallistujat ovat löytäneet ongelmien kanssa selviämiseen useita erilaisia strategioita. Kyselylomakkeiden perusteella tärkeimmiksi strategioiksi nousivat tehtäväsuuntautuneet strategiat. Osallistujat eivät pääosin poikenneet vertailuaineistosta verrattaessa eri strategiatyyppien suhteellista käyttöä. Haastatteluaineistossa keskeisiksi strategioiksi aktiivisten tehtäväsuuntautuneiden strategioiden lisäksi nousivat muihin kohdistuvat strategiat sekä välttämis- ja kontrollikeskeiset strategiat. Keskeisiä osallistujien vahvuuksia olivat ajattelun resurssit ja yleinen kielellinen lahjakkuus. Diagnoosilla havaittiin olevan pääosin myönteisiä vaikutuksia, joskin se tuotti myös joitakin hankaluuksia.

Koska neljä kuudesta osallistujasta on naisia, tutkimus valottaa AS–populaatiossa vähemmistössä olevien naisten tilannetta. Tutkimuksen heikkouksina voidaan pitää pientä otosta sekä rajoittuneisuutta yhteen alaryhmään. Jatkotutkimukset tulee laajentaa koskemaan laajempia otoksia ja myös muilla kognitiivisilla tasoilla toimivia AS-ihmisiä. Tutkimuksen tuloksia voidaan hyödyntää AS-kuntoutuksessa, erityisesti selviytymiskeinojen arvioimisessa, sopeutumisvalmennuksessa ja vertaistuki-toiminnassa.

Asiasanat: Aspergerin syndrooma, sosiaalinen vuorovaikutus, kognitiivinen suoriutuminen, selviytyminen, diagnoosi, vahvuudet

CONTENTS

1. INTRODUCTION

Social interaction problems have been one of the main interests in Asperger's syndrome[1] (AS) studies, being one of its core features. However, there has not been much research on the coping of AS persons in social interaction or other settings. What is more, the body of research on AS adults is relatively small, compared to that on AS children. The purpose of this study is to investigate the coping of adult AS persons with problems in social interaction. The term social interaction is used here as an umbrella term that comprises social relations, communication and language use.

Autism spectrum disorders (ASD) is a widely used term that covers all the forms of autism and Asperger's syndrome. Cognitive theories in the field of ASD include Executive Dysfunction, Theory of Mind and Weak Central Coherence (Bartlett, Armstrong, & Roberts, 2003). Deficits in a Theory of Mind, that is, an understanding learned through social situations that other people have minds that differ from one's own, form the most established theory in the examination of social features in ASD (Baron-Cohen, Leslie, & Frith, 1985; Baron-Cohen, 1989; Brent, Rios, Happé, & Charman, 2004; Hale & Tager-Flusberg, 2005). Theory of mind deficits are to some extent present in AS, but they seem to be not as central as in other forms of ASD (Bowler, 1992; Happé, 1994; Kaland et al., 2005).

By contrast, social interaction problems in general have been core symptoms of Asperger's syndrome since its discovery by Hans Asperger (1995:37), who studied children with "severe and characteristic difficulties of social integration". The children had problems with communication and social interaction. In her account of Asperger's syndrome, Wing (1981) considered problems with non-verbal communication and social interaction along with speech, motor coordination, repetitive activities, resistance to change, specific skills and impairments as central features of AS.

There are still disagreements among researchers on whether Asperger's syndrome and autism can be treated as separate diagnostic categories (Dickerson Mayes, Calhoun, & Crites, 2001; Miller & Ozonoff, 2000; Tanquay, Robertson, & Derrick, 1998). According to Gillberg (2002), that there are currently four definitions of Asperger's

[1] The terms "Asperger's syndrome" and "Asperger syndrome" are used interchangeably in the literature.

syndrome in use in the scientific study of AS – these include the *International Classification of Diseases*, tenth revision (ICD-10, World Health Organization 1993); *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (DSM-IV; American Psychiatric Association, 1994); Szatmari, Bartolucci and Bremner (1989) criteria, and Gillberg and Gillberg (1989) criteria.

The diagnostic criteria for Asperger's syndrome in the DSM-IV (299.80 Asperger's Disorder) also include impairments in social interaction. There is no significant delay in language, in cognitive development, or in the development of age-appropriate self-help skills, adaptive behavior (other than social interaction) and curiosity about the environment (American Psychiatric Association, 1994). The ICD-10 criteria (World Health Organization, 1993) are similar, including abnormalities of reciprocal social interaction. According to ICD-10, there is no delay or retardation in language, or in cognitive development (World Health Organization, 1993.).

The cognitive level of people with Asperger's syndrome is often average or high (Ehlers et al., 1997; Gillberg, 1989). Especially verbal intelligence is often above average (Nass & Gutman, 1997). However, the cognitive profile is often uneven, with verbal intelligence being higher than performance intelligence (Ehlers et al., 1997; Gillberg, 2002). These two types of cognitive performance can be separated in, for instance, the Wechsler Adult Intelligence Scale (WAIS; Wechsler, 1955, 1997) test battery – peaks in test performance have been found in verbally mediated WAIS subtests, for example 'information' and 'comprehension' (Gillberg, 2002; Klin, Sparrow, Marans, Carter, & Volkmar, 2000). By contrast, less good or markedly inferior results can be found in performance subtests, for example 'picture arrangement' and 'arithmetic' (Gillberg, 2002). Some contrary evidence has also been reported, questioning the difference between verbal and performance intelligence (Barnhill, Hagiwara, Myles, & Simpson, 2000). Moreover, the cognitive profile and success in test tasks that require social cognition and language use often do not match the difficulties encountered by AS persons in real-life situations (Channon, Charman, Heap, Crawford, & Rios, 2001; Green, Gilchrist, Burton, & Cox, 2000; Klin, Jones, Schultz, & Volkmar 2003; Nass & Gutman, 1997). Therefore, a combination of cognitive tests, self-report measures and interviews are needed in examining social interaction problems as a whole.

Capps, Sigman and Yirmiya (1995) found a significant negative correlation between the IQ scores of children with an ASD and their own perceived social competence. They also found a positive correlation between IQ and parents' reports of socialization skills. This discrepancy seems to pinpoint that awareness of social difficulties may even be over-emphasized in persons with a higher IQ, which may have connections with depression.

Depression has been found to often co-occur with Asperger's syndrome and problems with social interaction (Ghaziuddin & Greden, 1998; Hedley & Young, 2006; Kim, Szatmari, Bryson, Streiner & Wilson, 2000). Barnhill (2001) found that depression is linked with attributions for social failure in AS persons: attributions to ability correlated with depressive symptoms. She also found that the higher the intelligence level, the less the participant attributed social success to task difficulty and chance. In spite of research on depression, there have not been studies focusing on self-esteem in AS persons.

Social difficulties during childhood and adolescence often reveal the symptomatology of AS (Perry, 2004). Social interaction problems have been widely documented in AS (Attwood, 1998; Gutstein & Whitney, 2002; Wing, 1981). Peer interaction problems reported by Asperger (Wing, 2000) have also been acknowledged later after the appearance of Asperger's syndrome as a diagnostic category (Church, Alisanski, & Amanullah, 2000; Green, Gilchrist, Burton, & Cox, 2000; Tantam, 2000a). AS persons also have difficulties in forming social relationships (Green, Gilchrist, Burton, & Cox, 2000).

Interpretative and productive difficulties with pragmatics and non-verbal communication are central in language use and communication of AS persons (Tager-Flusberg, 2005; Tantam, 2000a). They are present especially when interacting with unfamiliar people (Landa, 2000). The persons experience troubles with simultaneous facial, voice, body and situational cues in social interaction situations (Koning & Magill-evans, 2001). Eye-contact may be lacking or inappropriate (Tantam, Holmes, & Cordess, 1993). Showing and interpreting emotions may also be impaired (Attwood, 1998; Njiokiktjien et al., 2001) although this does not extend to emotional coldness (Attwood, 1998; Ben Shalom et al., 2006; Gillberg, 2002). Adjusting the language production relative to the context or conversational partner may also prove difficult (Myles & Simpson, 2002). Literal interpretation of figures of speech, humour and irony

has been found to be an eminent feature in AS persons' language comprehension (Martin & McDonald, 2004; Ozonoff & Miller, 1996). Some speech and prosody problems have also been found, although studies differ in terms of their severity (Fine, Bartolucci, Ginsberg, & Szatmari 1991; Shriberg et al., 2001). Further, AS persons' references to previous discourse can be somewhat unclear (Fine, Bartolucci, Szatmari, & Ginsberg, 1994).

Korhonen (2006) studied the linguistic and communicative problems in published autobiographies of four AS adults, and found them to have problems with for instance non-verbal communication, literal-mindedness, lack of common ground in interaction, vagueness of social situations and conversation dynamics. Korhonen also reported on withdrawal and unwillingness to interact with others in some contexts.

Wing (1981) states that persons with AS may be aware of the difficulties in social interaction, but attempts at overcoming them fail in most cases. Further, Myles and Simpson (2002) state that AS persons have a need for social contacts in contrast with many other forms of ASD. According to Tantam (2000a) long-term intimate relationships are exceptional in the AS population, but when they exist they boost social development.

An early diagnosis has been found to be vital for the mental state and academic progress of AS persons as it informs the person, the parents and the educators of the special issues in the condition (Perry, 2004; Scahill, 2005). Howlin and Asgharian (1999) discovered in their study that children with autism get the diagnosis earlier than AS children. They also noted that the timing of the diagnosis is essential for the child's coping. Without the diagnosis, the AS person's problematic behaviour may be misinterpreted as intentional or rude (Safran, 2001). There have been found three ways persons respond to AS diagnosis: with improved confidence and energy, with a retreat into the disability and withdrawal from relationships with non-AS people – relationships with AS people tend to increase - and with resentment for being singled out (Levy, 2001).

A central effect of a diagnosis are the interventions targeted at social interaction problems. These include for instance teaching theory of mind skills (Howlin, Baron-Cohen, & Hadwin, 2002; Swettenham, Baron-Cohen, Gomez, & Walsh, 1996), social stories (Sansosti & Powell-Smith, 2006), comic strip conversations (Gray, 1994; Rogers & Myles, 2002), and social skills groups (Howlin & Yates, 1999; Solomon, Goodlin-

Jones, & Anders, 2004). Peer groups have also been perceived as helpful and bringing satisfaction to AS persons and the parents in the case of adolescents (Broderick, Caswell, Gregory, Marzolini, & Wilson, 2002; Weidle, Bolme, & Hoeyland, 2006). Many of the interventions are designed for children or adolescents, specific interventions for adults are scarce.

With or without diagnosis, social situations act as major stressors in the lives of persons with AS that require coping (Tantam, 2000b). Coping can be defined as the ways in which an individual tries to enhance her or his physical and psychological well being during stress (Endler & Parker, 1990). Lazarus and Folkman (1984:141) define coping as the "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person". Coping behaviour consists of active use of cognitive and emotional capacities. Lazarus and Folkman (1984) differentiate between coping and automatic adaptive processes.

A relatively often-used definition of stress is that by Lazarus and Folkman (1984). They see psychological stress as a relationship between the person and the environment that is appraised by the person as taxing or exceeding her or his resources and endangering her or his well-being. In addition to being the result of stress, somatic factors can also influence it (Selye, 1993). According to Lazarus (1993), psychological stress centers on the negative emotions – the role of positive emotions is vital in relieving stress.

Coping can be seen as a multidimensional phenomenon. Two major multidimensional theories are the division between emotion- and problem-focused coping (Folkman & Lazarus, 1985; Folkman, Lazarus, Dunkelschetter, DeLongis, & Gruen, 1986; Lazarus & Folkman, 1984) and a three-dimensional model which includes problem-oriented, emotion-oriented and avoidance-oriented coping[2] (Endler & Parker, 1990; Endler & Parker, 1994). Emotion-focused coping is directed at lessening emotional distress while problem-focused coping is similar to the analytic strategies used for problem-solving with the exception that problem-focused coping is also directed inward (Lazarus & Folkman, 1984). Avoidance can include elements from both emotion- and problem-focused coping (Endler & Parker, 1990). These two approaches

[2] Lazarus and Folkman use the term *focused* while Endler and Parker use the term *oriented*. In essence, these are interchangeable.

have been integrated in the study at hand. In previous studies task-oriented/problem-focused coping has been found to be most effective of the three dimensions (Endler, 1997; Park, Folkman, & Bostrom, 2001).

Coping can be assessed in two ways: either as a disposition, trait or style, or as a process (Cohen, 1987; Penley, Tomaka, & Wiebe, 2002). In this study the latter approach is mainly adopted, with coping examined through specific episodes reported by the participants during the interview. However, the self-report forms also reflect tendencies to cope with certain problems.

The adaptiveness of coping depends on the domain of outcome studied, the point in time and the context (Cohen, 1987). Received social support and cognitive restructuring have been found to positively influence adaptiveness (Lazarus & Folkman, 1984; Frazier, Tix, Klein, & Arikian, 2000), while social withdrawal has been associated with poorer adjustment (Frazier, Tix, Klein, & Arikian, 2000).

Coping in Asperger's syndrome has been studied primarily through the family members of the AS person (Dellve, Cernerud, & Hallberg, 2000; Higgins, Bailey, & Pearce, 2005; Little, 2002; Pakenham, Samios, & Sofronoff, 2005). Carrington, Templeton and Papinczak (2003) come close to coping of AS persons by studying how they form and maintain friendships. What is more, Carrington and Graham (2001) studied the challenges faced by teenagers through interviews of two adolescents and their mothers. As one of the themes they found that the need to belong was associated with stress in social interaction and ways of coping with the stress.

Korhonen (2006) found in AS autobiographies that the AS persons use many coping strategies for dealing with social interaction problems and that the other persons surrounding them use a variety of accommodation strategies. The coping strategies included avoidance, own awareness of AS and reflecting on the problematic situations. Emotional support and understanding was a central accommodation strategy.

In general, the research field is currently lacking as regards the coping of AS persons in social interaction. Besides Korhonen (2006), there has not been any research on the coping of adult AS persons. Searches within PsycINFO and ERIC with keywords "asperger" and "coping" and without year limitations yielded 9 results for each database, none of which directly examined the coping of AS persons. Further, none of the studies found in the databases were associated with AS adults. This study pilots the use of qualitative interview data to examine AS persons' coping.

As discussed above, there are few studies on social interaction and coping in AS adults. The gaps in existing research led this study to address four questions. First, there was a need to examine the cognitive resources of the participants, especially those that are related to social interaction, in order to form a picture of their basic resources. Second, the problems in faced by the participants in everyday social interaction were investigated. Third, the coping strategies for dealing with the social interaction problems were studied. Both differences and possible similarities between the participants were studied in relation to the problems and coping strategies. Finally, the effect of a diagnosis on the AS person's coping, not discussed in previous research literature, was also examined.

2. METHOD

2.1. Participants

Six participants, four females and two males, were selected through announcements in the *Autismi* (Autism) magazine of the Finnish Association for Autism and Asperger's Syndrome and aspalsta.net (http://www.aspalsta.net), a Finnish discussion forum for Asperger's syndrome. The participants were aged between 23 and 58 years, their mean age was 39. All participants had a diagnosis of Asperger's syndrome, acquired between 2001 and 2005. Three participants had a Master's level degree and the other three had unfinished studies in higher education. Five of the participants lived in an intimate relationship and three had children. The participants resided in both the rural and urban areas of central, western and southern Finland. All participants gave consent to publish the findings of the data, given their identity was not revealed. The population chosen for this study is not representative of the AS population because of a large over-representation of females – according to Ehlers and Gillberg (1993) there is a predomination of males in the AS population. The gender distribution of the data was due to the fact that it was harder to recruit males than females for the study.

2.2. Research methods

The participants took part in an interview and completed Wechsler Adult Intelligence Scale version III test battery (WAIS-III; Wechsler, 1997) standardized for the Finnish population, without complementary tests. WAIS-III was chosen to measure the participants' overall cognitive resources. As a deviation from standard WAIS procedure, the participants were asked to tell a story about each picture sequence during the 'Picture Arrangement' subtest.

The participants also filled in Rosenberg Self-esteem Scale (RSE; Rosenberg, 1965), Coping Inventory for Stressful Situations (CISS; Endler & Parker, 1990; Endler & Parker, 1994), short form, and Ways of Coping Questionnaire revised version (WCQ; Folkman & Lazarus, 1985; Folkman et al., 1986; Lazarus & Folkman, 1984). The forms were selected because of their wide usage. In addition, psychometric properties have been well-researched for RSE (Gray-little, Williams, & Hancock, 1997; Whiteside-mansell & Corwyn, 2003; Zimprich, Perren, & Hornung, 2005), CISS (Cohan, Jang & Stein, 2006; Endler & Parker, 1994; McWilliams, Cox, & Enns, 2003), and WCQ (Folkman, Lazarus, Dunkelschetter, DeLongis, & Gruen, 1986; Lundqvist & Ahlström, 2006). Comparison group data for CISS was obtained from the Jyväskylä Longitudinal Study of Dyslexia – it represented non-dyslectic control parents who did not have dyslexia in the family (n=217). No comparison data was available for RSE or WCQ.

The Rosenberg scale was selected to measure the participants' self-esteem to provide information on how the participants perceive themselves as persons. A unidimensional approach to the scale was chosen (Gray-little, Williams, & Hancock, 1997; Whiteside-mansell & Corwyn, 2003; Zimprich, Perren, & Hornung, 2005), although there is also some evidence for multidimensionality of the scale (Goldsmith, 1986; Serretti, Olgiati, & Colombo, 2005).

The Coping Inventory for Stressful Situations, based on a three dimensional model of coping and the Ways of Coping Questionnaire, based on a two-dimensional model of coping, were used to provide additional information on coping, complementing the interview data. CISS gave a more general picture of the participants' coping, while WCQ provided situation-specific information on coping. A three-scale system of CISS and an eight-scale system of WCQ were used. Adaptive, problem-focused coping is represented by two scales in WCQ: confrontive coping and planful problem-solving. The thematic interview used (see Table 1) covered the current life situation of the participant, problems in social interaction, language use and communication; strengths and coping, the effects of a diagnosis, and future orientation of the participant.

TABLE 1. Structure of the research interview

Themes	***Topics***
1. Life situation of the participant	- participant's age, work, studies, school attendance, family background, own family, character
2. The effects of a diagnosis	- the acquisition of a diagnosis - the effects of a diagnosis on social interaction and participant's other life - the participant was asked to elaborate on some of the Gillberg and Gillberg (1989) criteria concerning social interaction
3. Social interaction	- participant's social self - acting in social situations - difficulties in social situations - problems, strengths and development needs in language use
4. Strengths and coping	- the participant's strength areas - coping with difficult social situations - things that help the participant's coping
5. Future orientation	- how the participant sees her or his future

2.3 Research procedure

The data collection was conducted between December 2005 and April 2006. The interviews lasted for between two and three hours. Both researchers acted as interviewers, with one of them being more concerned with topic control and another with the additional questions and deepening of the themes. During the interview, the participant was also presented Gillberg and Gillberg (1989) diagnostic criteria regarding social interaction, language use and communication on A4 papers and asked to elaborate on them. The interviews were recorded on an MP3 player and subsequently transcribed from MP3 files into text by the researchers.

After the interview, a break followed before the WAIS-III test battery. WAIS-III was completed in a row with an occasional break allowed for the participant. The battery

was instructed, examined and scored by a researcher with clinical experience of the use of WAIS battery. Another of the researchers conducted the voice recording of the tasks and assisted in the observation of the tasks. The participants were given feedback on their performance in the tests later on. The feedback did not concern the interview or the self-report forms.

The self-report forms were filled in during the session. The participants were asked to fill in the forms without haste and according to her or his inner sensations. The interview acted as a primer to the self-report forms. This is a modification of Folkman et al. (1986) technique of asking the participants to elaborate on the stressful situation before completing the form. Standard instruction was used for The Coping Inventory for Stressful Situations. In the Ways of Coping Questionnaire the participant was asked to identify three main problems in the everyday social interaction, separated by different colors. The participants were then asked to answer the questions one problem at a time. The filling in of the forms was also recorded with an MP3 player. Some of the participants provided additional commentary on the forms that was transcribed into text.

The interview, the cognitive test battery and the self-report forms were all completed within a single session, with its duration varying between approximately five and seven hours with breaks.

2.4. Analysis

2.4.1. Cognitive assessment

The cognitive level data was used for providing additional information on the participants' coping. The participants' cognitive level was measured by WAIS-III. It was scored according to the manual. The participants' performance in telling stories during the 'Picture arrangement' subtest was monitored.

2.4.2. Assessment of self-esteem and coping

The Rosenberg Self-Esteem Scale, the Coping Inventory for Stressful Situations, and the Ways of Coping Questionnaire were analysed by SPSS software (SPSS Release 12, 2004). Scores were calculated for RSE. Scale scores – task-oriented coping, emotion-oriented coping, avoidance-oriented coping - were calculated for CISS data. WCQ was examined according to eight empirically constructed scales: confrontive coping, distancing, self-controlling, seeking social support, accepting responsibility, escape-avoidance, planful problem-solving, and positive reappraisal. Every participant was calculated a mean of the three problems for each item in the questionnaire.

A t-test was carried out for CISS data to analyze differences in scale score means between AS persons and the comparison group. A Friedman test was conducted for WCQ to find out the proportions of different coping scales in coping with the problems in social interaction and thus provide specific information on the participants' coping as a group.

2.4.3. Interview

The qualitative interview data was coded by using Atlas-Ti qualitative analysis software (Atlas-Ti version 4.2, 2000). The coding was done by mutual agreement of the researchers, with both researchers analyzing simultaneously the same data. Agreement on the categories was sought by careful examination of the data in the case of differences in the researchers' conceptualizing of the phenomena.

All contents of the interview data were first categorized. The categorization followed the principles of open coding: names were given to paragraphs related to particular phenomena (Glaser & Strauss, 1967; Strauss & Corbin, 1990). Subsequently, the categorization was changed to follow the main themes of the interview, with the exception of the current life situation of the participant to ensure anonymity.

Subcategories emerged within the themes during the analysis process. These were discovered through axial coding: putting the data together in new ways by making connections between the categories (Glaser & Strauss, 1967; Strauss & Corbin, 1990). Axial coding took place through the building of networks of categories and

subcategories. In turn, networking the categories enabled to make comparisons (Glaser & Strauss, 1967; Strauss & Corbin, 1990) between the categories.

The main themes of the interview were selected as the core categories through selective coding (Strauss & Corbin 1990). The validity of the category system was checked against joint data listings provided by the software for each category. Changes were made to the categories to improve the correspondence between the category labels and the data. Some of the categories were submerged to others during the final adjustments.

After the theory was formed from the data, data samples were selected to illustrate the categories. Samples were selected that represented the general outlook of a particular phenomenon and gave valuable insights in its contents. When possible, multiple examples were chosen to illustrate the differences and similarities between the participants. Atlas-Ti software enabled the comparison of the frequencies between the categories – the frequencies further describe the relationships between the categories.

3. RESULTS

3.1. Cognitive abilities

WAIS-III subtest scores and IQ indexes are depicted in Table 2 below. The mean overall IQ (Intelligence Quotient) score was 125, thus well above average. Overall IQ scores varied between 124 and 136, with the exception of one score that was 100. The participants' verbal IQ index was in general higher than their performance IQ index. The participants' mean performance was highest in subtests 'Similarities', 'Information' and 'Comprehension', all of which belong to the verbal component. Performance in the 'Picture completion' subtest was weakest relative to other subtests.

TABLE 2. WAIS-III subtests and indexes

Subtests	*P1*	*P2*	*P3*	*P4*	*P5*	*P6*	*Mean*
Verbal							
Vocabulary	17	15	11	13	14	13	14
Similarities	15	17	12	14	14	16	15
Arithmetic	16	16	8	17	11	15	14
Digit Span	11	13	10	13	12	18	13
Information	17	19	13	15	12	16	15
Comprehension	18	14	12	15	14	16	15
Performance							
Picture Completion	12	12	5	14	11	16	12
Digit Symbol-Coding	14	9	13	12	16	15	13
Block Design	14	12	9	15	15	15	13
Matrix Reasoning	15	13	9	14	17	13	14
Picture Arrangement	18	15	9	13	13	16	14
Indexes							
VIQ	135	135	106	128	118	135	126
PIQ	129	114	94	123	128	132	120
IQ	135	127	100	127	124	136	125

Note: Subtest scores are standard scores. Their range is between 1 and 19.
P1…P6 = participant 1…participant 6, Mean = mean of participants,
VIQ = Verbal Intelligence Quotient, PIQ = Performance Intelligence Quotient,
IQ = Overall Intelligence Quotient

All participants succeeded well in telling stories during the 'Picture Arrangement' subtest. Some participants were unable to decipher the logic of a sequence of events although they arranged the cards in a correct order.

3.2. Self-esteem and coping

Table 3 aggregates self-esteem and coping scores, as well as the future orientation of the participants. RSE scores varied between 17 and 29 (the maximum score is 30). Two groups of participants were identified – those with intermediate and those with high self-esteem. Thus, none of the participants had a notably low self-esteem. Future orientation was included in the table to enable a comparison between it and RSE scores.

According to CISS, task-oriented coping (mean 25.5) was most the widely used dimension by the participants compared to avoidance-oriented (mean 16.3) and emotion-oriented coping (16.5). It was the most consistent of the scales in AS persons and more consistent in AS persons than in the comparison group (Std. 1.6 in AS groups vs. 3.8 in the comparison group). Other scales exhibited more individual differences. A t-test yielded no significant differences in scale means between AS persons and the comparison group. Table 3 shows that four of the participants do not, by and large, differ from the comparison group in terms of the three coping dimensions. Two participants used more emotion-oriented coping than the comparison group, another of them also used avoidance more than the comparison group.

Table 3 also shows the individual tendencies of the participants in WCQ. The group tendencies of WCQ scales are presented in Table 4. Self-control and planful problem-solving were the most extensively used coping strategies. Also, distancing and social support were central strategies. Positive reappraisal and confrontive coping were used relatively little by the participants. Therefore, of the two scales representing adaptive, problem-focused coping (confrontive coping, planful problem-solving) only planful problem-solving stood out as important in the participants' coping.

TABLE 3. Participants' self-esteem, coping and future orientation.

Partici-pant	CISS Task	Avoidance	Emotion	RSE	WCQ	Future orientation
P1	+/- (25)	+/- (15)	+/- (15)	High	1.distancing 2.planful problem-solving 3.escape-avoidance	Neutral
P2	+/- (25)	+/- (12)	+ (20)	Intermediate	1.self-control 2.planful problem-solving 3.social support	Positive
P3	+/- (24)	+/- (15)	+/- (13)	Intermediate	1.self-control 2.distancing 3.social support	Positive
P4	+/- (24)	++ (25)	++ (25)	Intermediate	1.self-control 2.planful problem-solving 3.accepting responsibility	Neutral
P5	+/- (28)	+/- (19)	+/- (12)	High	1.planful problem-solving 2.social support 3.self-control	Positive
P6	+/- (27)	+/- (12)	+/- (14)	High	1.self-control 2.planful problem-solving 3.accepting responsibility	Positive

Note: The minimum score for each CISS scale is 7 and maximum 35. The results were compared to a group of non-AS adults (n=217). +/- = within comparison group std., + = one std. above comparison group mean, ++ = two std. above comparison group mean. The numbers in brackets indicate participants' scores for each scale. Comparison group std. was 3.8 in Task-oriented scale (mean 26.3), 4.3 in Avoidance-oriented scale (mean 15.4), and 4.5 in Emotion-oriented scale (mean 15.4). RSE scores were divided in three groups: low (0 to 9 points), intermediate (10 to 19), high (20 to 30). Three of the most used coping strategies in WCQ were identified for each participant.

TABLE 4. Ways of Coping Questionnaire scales

Scale	*Mean rank*
Self-control	7.2
Planful problem-solving	6.8
Distancing	5.0
Social support	4.5
Accepting responsibility	4.0
Escape-avoidance	3.8
Positive reappraisal	2.7
Confrontive coping	2.2

Note: $p < 0.01$ (2-tailed), $df = 7$. The ranks express the relationships between the scales. The higher the rank, the more the scale appears in the data.

3.3. Interview

In all themes of the interview presented below the representation of participants (P1, P2, P3, P4, P5, P6) varied according to the category: some categories were mentioned by more participants than others. Some of the categories were included in the final theory, although they appeared only in the accounts of one participant, if they were central to that person. The results for each interview theme are condensed in tables 5, 6, 7 and 8. Each table represents main categories and subcategories as well as the frequencies for main categories and frequencies for each subcategory. There were no major differences between male and female participants as regards the problems, strategies, strengths, the effects of a diagnosis or future orientation.

3.3.1. Problems in social interaction

Seven main social interaction problem categories were identified: communicational problems, problems in social situations, problems in social relationships, rigidity, cognitive difficulties, emotional problems, and lack of knowledge about Asperger's syndrome (Table 5). Of these, communicational problems, problems in social situations

and problems in social relationships were the three most significant categories in numbers of total appearances.

About one third of all problems in the data were communication-related. All of the participants mentioned problems in non-verbal communication in their social interaction. The participants described lacks in their expressions and gestures:

> P4: For instance, my dad had told a joke and I just smiled a little – dad said that it was a bit a bit funnier, and I did think it was very funny. I guess was conscious of not showing my feelings to others, but now I have actively invested in showing them.
>
> P5: And then, if someone has died and I laugh at it. I don't really, or some accident, I really don't laugh at it. There is just some expression when listening, the cheek muscles are tense or something, and it must look like I was having fun.

Participant 4's excerpt also illustrates the major strategy of active efforts, which is one of the central coping strategies. The participants also had widespread problems in understanding the non-verbal messages.

> P2: Well, I have had interpretation problems with others' messages, maybe still. Especially when, I have difficulties in making out anything but guesses, unclear assumptions if there is a discussion and the person says this and the non-verbal communication says that. Or if the verbal message is not clear, then it is hard to make out what the other person thinks and means.
>
> P4: I didn't always notice if I was bullied, or I did notice that there was something odd in the situation, that it didn't go as it should have. I wasn't sure why people did such things or if there was anything besides my imagination.

Many of the participants have also experienced difficulties in expressing themselves verbally and understanding others' verbal messages. Some were also partly unwilling to interact with others.

Problems in social situations were identified often by the participants. A female participant gives an example of the difficulty of following and recognising social rules:

> P3: Children are easy and honest. Then they grow up and start to lie. Well, it is a common agreement but nobody has told me these rules.
>
> P2: And the thought "how should I behave in this situation" comes to mind perhaps even unnecessarily as an Asperger person.

TABLE 5. Categories of problems in social interaction (252)

Main category	*Communicational problems (78)*	*Problems in social situations (62)*	*Problems in social relationships (57)*	*Rigidity (20)*	*Cognitive difficulties (17)*	*Emotional problems (11)*	*Lack of knowledge about AS (7)*
Intermediate categories and their subcategories	**Non-verbal communication** - lacks in expressions and gestures (15/6) - special eye contact (9/5) - understanding the messages of social interaction (8/5) **Difficulties in expressing oneself** - deviant use of voice (7/5) - writing difficulties (8/3) - using complicated expressions (4/3) - telling narratives (2/1) - others' inaccurate interpretations (4/3) **Difficulties in understanding others** - hearing comprehension (8/4) - literal interpretation(5/4) **Unwillingness to interact** - problems in social speech (6/2) - social interaction as a disturbance (2/1)	**Difficulties in group situations** - interaction in a group (8/3) - different roles in situations (7/3) - problems during interviews (3/2) - inability to cooperate (2/2) **Difficulties in giving space** - tendency to keep the floor (7/2) - stretching social situations (2/2) - inability to take others into account (2/1) **Following social rules** - difficulties in recognizing social rules (16/5) - fearlessness (3/1) **Oppressiveness of situations** - reacting to quick situations (9/3) - losing the ability to communicate in stressful situations (3/1)	**Relations between people** - relations to peers (14/6) - relations to other girls/women (10/3) - inability to form social relationships (6/4) - maintaining relationships (4/3) - recognizing familiar people (3/1) - bullying at school (2/2) - politics (2/1) - relations to the opposite sex (1/1) **Initiating interaction** - difficulties in finding topics for conversation (9/3) - getting to know other people (6/3)	**Rigidity in communication** - general rigidity in comm-unication (13/5) - expressing oneself in a strict and formal manner (6/4) - rigid following of rules (1/1)	**Lack of academic skills (6/3)** - learning new languages (6/2) **Memory problems (4/2)** **Dyslexia (1/1)**	**Depression (8/3)** **Emotions in interaction** - expressing and reading emotional states (2/1) - controlling emotions (1/1)	**Participant's lack of knowledge on her or his AS (5/2)** **Uncertainty on telling others about AS (2/2)**

Note: The numbers in brackets indicate respectively the total number of mentions in the data and the number of participants mentioning the phenomenon. Main categories are only given their frequencies.

The comment of participant 2 hints that the unawareness of social rules might be acknowledged by the AS person and that that knowledge may be even more taxing. The social rules were also associated with turn-taking in conversations. For instance, one participant expressed a strong tendency to keep the floor to herself in conversations:

> P4: When I get excited, and someone wants to say something in between, it is not always possible. I do notice when they try to interrupt and I also notice when they get frustrated because of not being able to say their things. I don't want them to talk and I can't stop speaking, because I have an overwhelming need to finish what I was saying.

The excerpt above shows that the AS person may be aware of the fact that s/he are not acting according to the social rules, but s/he nevertheless continues to stay on the track chosen in the beginning.

Problems in social relationships were almost in par with the problems in social situations as regards their representation in the data. They are related to the social situations, but the difference between the two is that the data concerning social relationships exhibits more longevity in the social contact. Two main categories were relations between people and initiating the communication. The latter can be regarded as a link between the problems in social situations and longer social relationships: initiating the communication influences both how the person acts in social situations and how s/he is able to form longer relationships:

> P6: Well, there is the difficulty of still not being able to come up with anything rational to say, and pretty often I just stay quiet. There are too many situations where there isn't just some uninteresting stranger present, but a person with whom I will probably be dealing with later on, someone with something interesting to say, and I just can't find out how to get started if the person doesn't make the first move.

Three of the four female participants expressed problems in relating to persons of the same sex. Many of them reported on being able to associate better with men than with women. Coping with girls' complicated social interaction has been difficult for them.

> P3: I didn't sort of get on in the girls' world, in the land of whispers and social games. I still don't. I still am not able to converse with women.

All participants had problems in relating to persons of same age, especially during childhood and adolescence. Unawareness of correct interactions was a central reason for this, also for some interaction with peers didn't seem important or desirable.

> P1: Contacts with peers did feel important but I just couldn't make them.
>
> P5: When I was young I had reference groups whose members were a lot older than I was … I do remember that as a young child I was more like vertically oriented, the peer group didn't seem so important.

Problems with rigidity in communication were also present in many social situations and social relationships. These involved especially adapting to changing situations and meeting the demands of the situation. One participant explained her rigidity in conversations:

> P4: …when we are in a bunch of mates, smoking outside, the conversation flows swiftly from one topic to another … so, if there is some thing that I would have liked to say something about but didn't, I forcedly try to find a way to get back to the topic that went by a long ago, just because I have to say it aloud, although it doesn't give anything new to the situation.

The rigidity also shows in following rules to the letter and expressing oneself in a strict and formal manner.

The participants also reported on cognitive and emotional difficulties related to social interaction. Depression was one of the emotional difficulties. The following excerpt on depression shows the connection between depression and problems in social interaction:

> P6: Well, I became more and more unhappy, because when I think of the time between starting school and adult age, there was a growing need to be in contact with others. But the perception of not being able to, not having the courage to, not being accepted and eliciting strange reactions became more and more painful. This had an impact on that in time I became, well, you could say depressed. By and by, social relationships failed totally.

Lack of knowledge about Asperger's syndrome came up in the interviews two ways: some of the participants described the impact of not knowing about AS on their thinking, and some reported being uncertain on other's reactions to AS because of a lack of public knowledge about the condition. Below are the thoughts of a female participant describing her own lack of knowledge:

> P1: I tried to find ways to become normal, as it looked like something was wrong with me. I tried and tried and still things were falling apart and people getting mad at me, and I didn't understand why. So I ended up testing the weirdest things in order to become a bit

> more normal, and still didn't. Then I got frustrated and at that stage I was totally unable to form even the most basic relationship. I was really alone for many years.

The uncertainty on other's reactions towards AS is reflected in the participants' hesitation to tell about the condition:

> P2: [Getting a diagnosis] brought the problem of how to act with the knowledge of this disability of mine when applying for a job or at work – how to tell or whether to tell at all. People can knowingly or unknowingly misunderstand, this is why I haven't opened up to many people. I guess I will in time.

3.3.2. Coping strategies

Seven different strategy groups were found (Table 6). These were activity-focused strategies, strategies involving others, avoidance-focused strategies, emotion-focused strategies, strategies in language use and strategies promoting own well-being. Activity-focused strategies were clearly the most common ones. Strategies involving others and avoidance-focused strategies were also frequently used by the participants.

The activity-focused strategies divide in two main classes: initiativity and reflection. The initiativity of the participants shows for instance in learning to deal with problems:

> P6: I approach everything through theory, I study first and then apply what I have learned – this applies also to social relations. I have read about them and tried like scientifically learn about them, and maybe it is also somewhat of use.

> P2: I can look at you long and focused, but it might be a conscious decision to take eye-contact.

The learning shows in many ways, such as participant 2's conscious actions in social situations that replace natural reactions. The initiavitity is also manifested by active efforts by the participants to find out about things causing difficulties and to master situations that prove to be difficult:

> P4: Well, at first I had [problems with eye contact] - when I tried to stop it, and to look people in the eye, I missed everything they said. I didn't remember any of it, it went totally by, I just focused on looking people in the eye. But I think it works better nowadays, although maybe I might sometimes - when I'm tired or something - start to look people in the mouth.

TABLE 6. Categories of coping strategies (213)

Main category	*Activity-focused strategies (80)*	*Strategies involving others (41)*	*Avoidance-focused strategies (39)*	*Control-focused strategies (21)*	*Emotion-focused strategies (12)*	*Strategies in language use (10)*	*Strategies promoting own well-being (10)*
Intermediate categories and their subcategories	**Reflection** - thinking about issues (26/6) - preparing oneself beforehand (6/4) - evaluating social situations (5/3) - drawing conclusions (3/1) **Initiativity** - learning (15/4) - active efforts (11/5) - taking control of the situation (9/4) - finding out about things (5/3)	**Using others' help** - social support (11/4) - using professional help (10/4) - discussing experiences with other AS persons (4/3) **Consciousness of AS** - telling others about AS (9/4) - not telling others about AS (2/2) **Taking others into account (2/2)** **Choosing the communication partner (3/2)**	**Avoiding the situations** - leaving from problematic situations (8/4) - avoiding the situations beforehand (9/5) - withdrawal (7/3) - giving up (5/3) - observing the situations from a distance (4/3) - letting the situation pass (4/2) **Drifting (2/1)**	**Using self-control (21/6)**	**Expressing emotions and producing them** - anger (4/2) - using humour (2/2) - crying (1/1) **Accepting oneself (5/3)**	**Using exact expressions (6/3)** **Using written communication (2/2)** **Using indirect expressions (2/1)**	**Using aiding instruments (6/2)** **Exercise and relaxation (3/2)** **Religious activities (1/1)**

Note: The numbers in brackets indicate respectively the total number of mentions in the data and the number of participants mentioning the phenomenon. Main categories are only given their frequencies.

The reflection of the participants' regarding problematic situations includes thinking about issues, preparing oneself beforehand, drawing conclusions and evaluating social situations. Reflection in its different forms is used by all the participants in their coping. It is often-used and is well-functioning according to the participants:

> P3: Thinking and pondering is the starting point for everything.
>
> P2: The analysis in my head continues when the situation is over – "what was the reason for x and why did the person y do like that and what are the consequences"
>
> P5: I have also used intellectualization as a method for examining social interaction: it does reduce all the possible semantic-pragmatic misunderstandings.

Many of the strategies used by the participants involved others. The participants got help from persons close to them, professionals and other persons with AS.

> P1: I guess some people draw me towards more social activities. Like my mother, who used to drag me to the gym, seeing that I wasn't in a good shape and didn't take care of myself. But when I get started, I can maintain these activities myself.

The excerpt above shows how the AS person might not always be the one who takes the initiative but may be able to cope and continue with initial help. Discussing experiences with other AS persons brought many positive aspects and new important social relations to participants' lives. However, a major choice for the participants was whether to tell non-AS people about their condition or not. Telling others and not telling others have both been used as strategies by the participants.

Avoidance-focused strategies were as widely represented in the data, as were strategies involving others. Participant 1 gives a description of leaving from problematic situations:

> P1: At times I have experienced that something is not at all useful to me, and I might be offered something which is totally strange to my way of thinking, or I might have experienced someone is using me and thinking I can be fooled, like at work. In those situations I have always just cleared out and left all behind me.

The problematic situations are often avoided beforehand:

> P1: Using telephone is gives me a lot of distress. I try to avoid it to the last and talk to people either in text through the internet or face-to-face.

One of the most significant and unified strategies were the control-focused strategies. All the participants reported on using self-control as a means of coping.

> P1: I try to restrict myself in order not to say things that embarrass others, because I could talk about almost everything.
>
> P4: I can notice other people noticing my gaze. And I also notice if they don't like it; then I try to stop it.
>
> P6: Well, my mother said I was vivid as a child but then became quiet. This was maybe the most important turn in my early life. I understood that if I am my natural self, I get into trouble. So I started controlling myself, which has been quite an important issue for me.

The comment of participant 6 shows the importance of the strategy to the persons. Controlling oneself manifests itself in many aspects of social interaction and communication with others, as the subjects of conversations and eye-contact given above.

Emotion-focused strategies - expressing emotions and producing them in others - and strategies in language use - using written communication and exact expressions - were also found. In addition, other, more general strategies were found that promote the participants' well-being. These were exercising, relaxation, religious activities and using aiding instruments.

3.3.3. Strengths

A third main theme in the interview was the participants' strengths (Table 7). The strengths were closely connected with the strategies – for instance, resources of thinking are connected with reflection as a strategy. Moreover, functioning social relationships provide a safe basis for using strategies and are the result of using strategies, for instance strategies involving others. Eight main strengths were discovered. These were resources of thinking, linguistic strengths, functioning social relationships, individuality, conscientiousness and exactness, emotions as a resource, good academic skills, and openness to new things. Resources of thinking and linguistic strengths stand out from others in terms of their frequencies in the data.

TABLE 7. Categories of strengths (85)

Main category	*Resources of thinking (24)*	*Linguistic strengths (22)*	*Functioning social relationships (10)*	*Individuality (8)*	*Conscientiousness and exactness (7)*	*Emotions as a resource (7)*	*Good academic skills (4)*	*Openness to new things (3)*
Subcategories	Intelligence and talents (12/5) Knowledge (4/3) Good memory (4/2) Intellectual distancing from problems (3/1) Planning skills (1/1)	Overall linguistic talents (12/5) Easiness of learning foreign language (5/2) Accurateness of expressions (3/2) Conceptualizing (1/1) Writing (1/1)	Easiness of performing to an audience (3/3) Ability to be in different roles (3/3) Ability to make social contacts (2/2) Seeing what others mean (1/1) Cooperativeness (1/1)	Focusing on one's own activities (3/3) Controlling activities from one's own needs (3/2) Using and thinking about social interaction only when needed (2/1)	Conscientiousness (4/1) Exactness (3/2)	Attitude (4/3) Humour (2/2) Calmness (1/1)	Good academic skills (4/3)	Getting excited by new things (2/2) Creativity (1/1)

Note: The numbers in brackets indicate respectively the total number of mentions in the data and the number of participants mentioning the phenomenon. Main categories are only given their frequencies.

Resources of thinking included for instance intelligence and talents, which was the biggest single strength over all strengths. The participants expressed that it has significantly helped their coping.

> P6: I like to think that on the positive side, if I think about my overall personality, are quick wits and an ability to absorb information. This means that in many situations I am informationally and intellectually ahead of others. It has compensated the feeling of uncertainty that has existed socially. And I have been able to show off by letting others know that I understand quickly and that I know a lot about things.

> P4: A neuropsychologist made all sorts of tests…the point range was between 0 and 20 with 10 being the average, I didn't score lower than 10 in any test, not even in those I was not doing well. Most of the tests were 16 and the worst scores were 10 or 11…I felt the tests I wasn't doing well in were extremely difficult – then I started to think it must be quite hard to be a sort of average person.

Of the linguistic strengths, especially unspecified overall linguistic talents came up. It was accentuated by the participants when language and communication were discussed during the interview. Other linguistic strengths were the easiness of learning foreign languages, conceptualizing, writing, and the accurateness of expressions. It should be noted that foreign languages and accurateness of expressions also posed problems for some of the participants. The latter was a strength in for instance the following way:

> P5: I think I can find accurate and well-describing expressions, contrary to what is said about people with Asperger's syndrome. And I also understand if someone else uses them.

Individuality is described by many participants as a strength. They appreciate individuality as a part of their personality. The individuality comes up as an exceptional property which the participants use to differentiate themselves from others. The individuality includes focusing on one's own activities, using and thinking about social interaction only when needed, and controlling activities from one's own needs.

> P5: The thing about not being dependent on the culture and social environment, like being in one's own capsule, prevents from going in for strange and harming activities that environment tries to impose on the person.

As a contrast to the emphasis on individuality, social relationships were also mentioned as strengths by some of the participants, although all of the participants also had problems with them.

3.3.4. The effects of a diagnosis

The diagnosis was discovered to be strongly linked with social coping. The effects of a diagnosis covered eight different aspects of coping, including the changes enabled by a diagnosis, the effects of a diagnosis on others' behaviour, explanation to problematic phenomena, making use of a reference group, doubts concerning the diagnosis, problems caused by the lack of a diagnosis, Asperger's syndrome as a frame of reference, and rehabilitation (Table 8). Most of the effects of a diagnosis were positive – some problematic effects were also discovered that were associated with doubts concerning the usefulness of the diagnosis and others' reactions toward the diagnosis.

The diagnosis enabled changes in the participants' activities, in their attitudes towards themselves, outlook on life, and also brought an end to depression.

> P6: I tried many kinds of tricks after finding out about my Asperger's syndrome. A long process of learning to heal socially and practically in life began.

> P3: Well, before lecturing on some thing monotonously to an another person, I think first. I can stop it. I have started to pay more attention to those kinds of things. And I feel it is a bad thing. It induces stress. I hope I can get rid of it and just lecture.

The excerpts above show an interesting contrast between the participants' attitudes towards the changes enabled by the diagnosis. Being conscious of one's AS can thus also act as a stressor, although in most cases the knowledge reduces stress.

Some participants have also been encountered the negative labelling effect of the diagnosis in terms of others' negative attitudes. This makes them wary of disclosing on their AS:

> P3: I have no fear [of others' defining through the diagnosis] because nobody knows anything. I get angry when I go to a health centre because of something else and they talk to me like I was a child because of Asperger's syndrome. It is furiating.

The diagnosis has been an explanation to problematic phenomena, boosting the participants' self-esteem and giving confirmation to their doubts. The diagnosis has also given the participants a reference group (persons with AS) that they take advantage of.

> P5: I have met all kinds of people, good folks, in the peer groups. They are funny. There aren't many communication problems, for that matter, when AS persons are together.

TABLE 8. Categories of the effects of a diagnosis (62)

Main category	*Changes enabled by a diagnosis (16)*	*Effects of a diagnosis on others' behaviour (9)*	*Explanation to problematic phenomena (9)*	*Making use of a reference group (6)*	*Doubts concerning the diagnosis (5)*	*Problems caused by the lack of a diagnosis (3)*	*Asperger's syndrome as a frame of reference (3)*	*Rehabilitation (1)*
Subcategories	Changes in the participants' activities (8/5) Changes in the participants' attitudes towards themselves (3/3) Changes in the participants' outlook on life (3/2) End to depression (2/1)	Fear of others' attitudes (3/3) Increase in others' consciousness (3/2) Others' negative attitudes (2/1) Others' attempts to hinder the participant's use of the diagnosis as an excuse (1/1)	Improved self-awareness (8/5) Confirmation to doubts (1/1)	Making use of a reference group (6/4)	Doubts concerning the usefulness of the diagnosis (3/2) Contradictory feelings towards the diagnosis (2/2)	Inaccurate treatment due to a lack of diagnosis (2/1) Changing a previous inaccurate diagnosis (1/1)	Asperger's syndrome as a frame of reference (3/3)	Rehabilitation (1/1)

Note: The numbers in brackets indicate respectively the total number of mentions in the data and the number of participants mentioning the phenomenon. Main categories are only given their frequencies.

After the diagnosis, the participants were able to use the diagnosis of Asperger's syndrome as a frame of reference in their lives, which helped to cope with feelings of inadequacy. In addition to positive feelings towards the diagnosis, the participants also doubted the usefulness of the diagnosis and had ambiguous feelings towards it.

3.3.5. Participants' future orientation

The participants' future orientation was also found to be linked with coping (see Table 3). It reflects the effectiveness of the coping strategies and strengths, showing how the participants think they will cope later on. The participants' orientation towards the future was quite homogeneous – two of the participants expressed neutral views, such as the following:

> P1: I don't plan much ahead. I live in this moment and I assume that [the future] is going to be a little difficult and diverse, and constant thinking with no ready-made solutions or five-year-plans.

Four participants experienced the future as positive. One of them described the change in his future orientation during his life:

> P6: The future seems exciting and promising. I will learn new things and totally new opportunities will open and combinations will come up to make use of my previous acquired talents and new skills. It is as if, well, when I was young I had dreams of future, then I had a dark picture of the future and now I have a light picture of the future. So this has been a major, very important change.

A significant factor in experiencing the future as positive has been the acquisition of a diagnosis, which has made changes such as the one above possible.

4. DISCUSSION

The main aims of this study were to investigate the cognitive resources - related to social interaction - of highly educated persons with Asperger syndrome, the problems they encountered in interaction and especially the coping strategies they have used. The effect of an AS diagnosis was also examined. Of these, the coping of AS adults has, by and large, not been studied before, except Korhonen (2006) study of the coping with linguistic and communicative problems in AS. What is more, the body of research on the effects of AS diagnosis is small. The use of interviews in studying the coping of AS adults has not been documented in the current research literature. In addition, the use of Coping Inventory for Stressful Situations and Ways of Coping Questionnaire for AS adults does not exist in studies found in the databases ERIC and PsycINFO.

The participants were found to possess a relatively high cognitive functioning, as measured by WAIS-III battery. The cognitive tests did not show lacks in basic resources for social interaction. Confirming the findings of previous studies (Gillberg, 2002; Klin, Sparrow, Marans, Carter, & Volkmar, 2000), especially their performance in the verbal scales was very high. The participants reported linguistic performance as a strength also in their everyday lives and emphasized its influence as a compensating factor. However, the differences between the verbal and performance abilities were not as consistent as in previous studies (Ehlers et al., 1997; Gillberg, 2002) – some participants performed equally well in both areas. Thus, there is heterogeneity within the AS population in terms of intelligence profiles that might be masked by studies with larger samples.

The self-esteem measures produced somewhat heterogeneous results with two groups of participants emerging in terms of their self-esteem – a group of participants with high self-esteem and a group of participants with intermediate self-esteem. The self-esteem scores were relatively high considering the co-morbid depression reported in many AS studies (Ghaziuddin & Greden, 1998; Hedley & Young, 2006; Kim, Szatmari, Bryson, Streiner & Wilson, 2000) and by the participants. In accordance with Barnhill (2001), problems and failure in social interaction were found to be related to depression in the AS participants.

The interview results show that the participants have faced many problems in social interaction, which were mainly associated with communication, social situations and social relationships. The results were in line with the findings of Korhonen (2006) of the linguistic and communicative problems encountered by AS persons with higher education and other studies concerning social interaction problems (Attwood, 1998; Gutstein & Whitney, 2002; Wing, 1981). New information was found for example on problems in social situations and social relationships. For instance, the difficulties encountered by AS women in interacting with other women deserve more attention. These found difficulties suggest that there are differences between the interaction styles of men and women, and that the interaction styles of men are more suitable for AS women.

The Coping Inventory for Stressful Situations produced task-oriented coping as the most widely used strategy by AS persons. Few differences were found between AS persons and comparison group adults. However, task-oriented coping was more consistently used in the AS group. Interestingly, two participants have used a great deal of emotion-oriented coping. This result emphasizes the importance of distinguishing between feeling emotions and showing and interpreting them (Attwood, 1998; Ben Shalom et al. 2006; Gillberg, 2002) the lack of which has lead to misinterpreting Asperger persons as emotionally cold. The lack of differences between AS persons and the comparison group hint that in spite of widespread problems, the participants have found ways of coping that have been effective. However, they also emphasize the fact that a qualitative approach is needed in examining the coping strategies in their context. The similarities also imply that there is a spectrum between AS and non-AS people, which also involves differential coping between less and more able AS persons.

According to the Ways of Coping Questionnaire results, self-control and planful problem-solving were the most used strategies by the participants – they were approximately on the same level in relative use. There was a clear distance between these amounts of these two scales and other scales. The lack of comparison data for WCQ and the small amount of participants inhibits investigations of the possible further similarities between AS persons and the comparison group.

On the grounds of the interviews, the participants have implemented a wide variety of coping strategies for the problems, most of which were adequate and well-functioning – the most used strategy types being activity-focused strategies, strategies

involving others, avoidance-focused strategies and control-focused strategies. On behalf of the coping strategies, this study replicated the findings of Korhonen (2006) in terms of social support, reflection, consciousness of AS, avoiding the situations and using aiding instruments. However, new insights were gained in the initiativity of the participants in social interaction, the use of self-control by AS persons, strategies involving others, and emotion-focused strategies.

On the basis of the self-report and interview results, it seems that problem-focused coping is clearly the most widely used strategy group by the participants. The interview results showed a clear tendency for reflection and initiativity by the participants within problem-focused coping. The strategy was found to be effective and suitable for the participants. Also, self-control was emphasized by the participants in coping with social interaction. The results of the interviews and self-reports also show that strategies involving others, including social support, have been largely used by the participants. Social support was found to be a resource in dealing with problems in interaction. It is also notable that some coping strategies produced more stress instead of reducing it. Especially reflection and avoidance were considered to be problematic for some.

Strengths were examined as resources in coping. Major strengths of the participants were resources of thinking, linguistic strengths, functioning social relationships and individuality. Especially their emphasis on intelligence and talents was of interest. Reflection coming up as a significant strategy and intelligence appearing as a central strength, it can be hypothesized that the intelligence of participants is a special resource in interaction and that there is a connection between the AS persons' intelligence level and coping - the participants themselves mentioned the influence of intelligence and talents repeatedly. This issue requires further studies.

Diagnosis has been a factor influencing mainly positively the coping of participants. All participants have received their diagnosis notably late. This may lead to differential outcome compared to an earlier diagnosis. The diagnosis enabled changes in the participants' functioning and thinking, had positive and negative effects on others' behaviour and gave an explanation to problematic phenomena. In addition, finding a reference group (AS persons) was important in improving the quality of life and coping of the participants. Some of the effects of the diagnosis were also negative, especially in terms of others' reactions, including professionals. These results support the clinical findings of Levy (2001). This two-fold nature of the effects of a diagnosis is important

to acknowledge, as it also implies that public and professional knowledge of the condition is still lacking. The diagnosis may also have influenced the participants' relatively high self-esteem and positive future orientation – however, this speculation needs to be addressed in subsequent studies.

The congruities between the findings produced by the interview and those of the self-report forms support the notion that a combination of interviews and self-report forms is a viable method for studying coping, especially the coping of AS persons. Both methods support each other in the conceptualization of coping. In the light of the results, the Coping Inventory for Stressful Situations and the Ways of Coping Questionnaire are suitable for examining coping in persons with Asperger's syndrome. However, the participants' high capacity for reflection may influence their abilities in responding to the questions. Moreover, the value of quantitative self-report data as such is limited because of the small sample size. Ways of Coping Questionnaire and Coping Inventory for Stressful Situations should therefore be tested with a larger AS sample.

Grounded theory was found to be a suitable method for analyzing data gathered through thematic interview. Each theme was treated as an emerging grounded theory of its own, which enabled the data to guide the process in spite of the limits set by the researchers in terms of the thematic structuring. Grounded theory methodology granted simultaneous access to the similarities between the participants and individual characteristics of the participants.

The results of this study may have practical value in rehabilitation contexts such as organized peer groups and adjustment training, where issues related to social interaction are discussed and dealt with. However, there is also a need for further investigations concerning the coping of AS persons, as this study does not give an adequate picture of the whole AS population with the majority of participants being female and all the participants having higher education. The participants of this study are at the most able end of AS, while they still have problems that are typical to AS. Possible coping differences within the AS population should be tested with a large sample of AS persons – all AS persons do not possess as high cognitive capacities as the participants of this study.

The reasons behind the noted differences in participation in the study between females and males with higher education are worth investigating as well. However, this study gives voice to the minority group of females in the AS population, adding

ingredients to the overall picture of AS. The relationship between cognitive level and coping also deserves more attention. What is more, studies focusing on self-esteem in persons with Asperger's syndrome are needed.

The present study is limited in terms of the number and representativeness of its participants. The results cannot therefore be generalized to the AS population – they serve rather as a first look into coping in Asperger's syndrome. Further studies are needed for examining coping in different forms of autism spectrum disorders as well as the differential outcomes within Asperger's syndrome. For instance, the finding that AS persons do not differ from a comparison group should be tested with a more representative sample. What is more, there is a need for studying the development of coping across the life span in the AS population, the relationship between intelligence and outcomes in AS, and developing further measures for assessing the effectiveness of AS persons' coping. Finally, further interventions should be developed in addition to those that already exist for enhancing the coping of AS persons in social interaction.

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