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**STUDIES ON CHILD AND ADOLESCENT
MENTAL HEALTH IN ICELAND**

by

HELGA HANNESDÓTTIR

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From the Department of Child Psychiatry
University of Turku
Turku Finland

Supervised by:

Professor Andre Sourander MD, PhD
Department of Child and Adolescent Psychiatry
University of Tromsø, Norway, and
Docent in Child Psychiatry
University of Turku, Finland.

and

Professor Jorma Piha MD, PhD
Child Psychiatry Clinic
University of Turku, Finland.

Reviewed by:

Professor Irma Moilanen, MD, PhD
Department of Child Psychiatry
University of Oulu
Oulu, Finland

and

Eeva Aronen, MD, PhD
Department of Child Psychiatry
University of Helsinki
Helsinki, Finland

Opponent: Professor emerita Eila Räsänen, Department of Child Psychiatry, University of
Kuopio, Kuopio, Finland

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To my family

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1. LIST OF ORIGINAL PAPERS

I. Hannesdóttir H. & Einarsdóttir S. The Icelandic Child Mental Health Study. An Epidemiological Study of Icelandic Children 2-18 Years of Age Using the Child Behaviour Checklist as a Screening Instrument. *European Child and Adolescent Psychiatry*, 1995; 4:237-248.

II. Hannesdóttir H., Sourander A. & Piha J. Comparison of behavioural problems between two samples of 2-to 3 year old children in Finland and Iceland. *Nordic Journal of Psychiatry* 2000; 54:13-17.

III. Hannesdóttir H. & Stefánsson J.G. Children and adolescents seen in a psychiatric outpatient clinic in Iceland. Demographic data and diagnosis of children and adolescents seen during two periods: 1973-76 and 1987-89. *Nordic Journal of Psychiatry* 1995; 49:169-174.

IV. Hannesdóttir H., Thyrfingsson Th. & Piha J. Psychosocial functioning and psychiatric comorbidity among substance-abusing Icelandic adolescents. *Nordic Journal of Psychiatry*, 2001;55.

Approval has been given by the publishers of the *Nordic Journal of Psychiatry* and the *European Child & Adolescent Psychiatry* to reprint the original papers in this thesis manuscript.

In the text the papers are referred to by their Roman numerals.

2. ABBREVIATIONS

ADHD	Attention Deficit Hyperactivity Disorder
ANOVA	Analysis of Variance
BMDP	Statistical Software
CBCL/2-3	Child Behaviour Checklist /2-3
CBCL/4-18	Child Behaviour Checklist/4-18
CI	Confidence Interval (95%)
DSM-III-R	Revised Diagnostic and Statistical Manual for Mental Disorder, 3rd edition
DSM-IV	Diagnostic and Statistical Manual for Mental Disorders, 4th edition
E	Externalizing
FN	False negative fraction
FP	False positive fraction
I	Internalizing
ICC	Intraclass correlation coefficient
ICD-9	International classification of diseases. Ninth revision
ICD-10	International classification of diseases. Tenth revision
NIMH	National Institute for Mental Health
OR	Odds Ratio
p-value	Observed significance level
r	Pearson's correlation coefficient
ROC	Receiver operating characteristic
SAA	National Association for Addiction Medicine
SES	Socio-economic status of parents
SD	Standard Deviation

SE	Standard Error
TRF	Teacher Report Form
WHO	World Health Organization
YSR	Youth Self Report /11-18

3. INTRODUCTION

Epidemiology investigates the distribution of disease / physiological function in human populations and related factors (Lilienfeld 1976). The field of child psychiatric epidemiology has existed for over 42 years but for many years lacked generally accepted definitions of the various child disorders needed for epidemiological studies. Child psychiatric epidemiologic studies create a framework for the development of academic standards, the facilitation of research and monitoring of training. This information is important in order to be able to plan a national mental health program for children in Iceland and to increase the interest of the academic medical community in child and adolescent psychiatry.

The first study in Iceland on the epidemiology of child mental health was undertaken in Reykjavík (Björnsson, 1974). The results of that study showed that the percentage of severely mentally disordered children ranged from 11.8%-30.8%, depending on their syndromes. No significant gender effects were found.

Iceland is a Nordic country with a child population ages 0-18 of 82.188 (December 2000). This collection of papers has been compiled at a time of accelerating change for those working in the field of child mental health. No earlier studies on the prevalence of child psychiatric symptoms in the general population of the whole country has been carried out before. There has been little research in child and adolescent psychiatry and communication has mainly been within and between teams rather than with similarly trained colleagues. The taxonomy and methods of assessment have improved dramatically in the past decade (1990-2000) thus providing a possibility to study the prevalence of child and adolescent psychiatric symptoms in a valid and reliable way.

Investigations on the prevalence of child psychiatric problems focused on a narrow range of behaviour / gender / age in case series until the report by Lapouse and Monk (1958) on the frequency of behaviour problems in a representative sample, randomly selected mothers of 6 to 12 year old children. This landmark study is considered to be the first epidemiological study in child psychiatry.

The Isle of Wight study by Rutter et al. (1970, 1976) was another milestone in its use of sound methodology and the combination of statistical and clinical approaches. The epidemiological approach added a new dimension to the understanding of psychiatric disorders in childhood.

Previous studies in child psychiatry were mainly individual case studies but not problem oriented studies on groups of children within a whole population.

Achenbach & Edelbrock (1981) provided prevalence data on a wide range of emotional and behavioural problems and competencies using the Child Behaviour Checklists (CBCL) and the Youth Self Report (YSR). They compared 1300 children from ages 4 to 16 years old who had been treated at mental health services with data on 1300 children from the normal population matched for age, gender, race and socio-economic-status (SES). These data were used as a basis for developing instruments (CBCL and YSR) that have since been useful in epidemiological and clinical research for children and adolescents in many countries.

Community epidemiological studies on the availability of services in many countries show that one child in five has psychiatric disorders and perhaps one in ten has significantly impaired function. However, only one in twenty receives any kind of mental health care and only one or two percent are treated in a special mental health centre (Burns 1991). Giel et al (1981) demonstrated that 80%-90% of mental health problems in children are missed at the primary care level. Training, attitudes and skills of primary physicians are important in recognizing psychiatric disorders in children and adolescents. A child health study usually costs much more than adult studies because of the need to combine information from parents, children, teachers, peers and others.

Questionnaire survey methods are much less expensive than face-to-face interviews when it comes to large samples. Questionnaire estimates, although sometimes less precise than those based on detailed interviews, can be supplemented by more accurate methods (interviews, laboratory evaluations, observations etc.).

Prevalence and incidence are the key epidemiological measures of the frequency of disorders in a population. They measure the occurrence of disorder at a specific instant in time (prevalence) and the occurrence of new cases during a certain time period (incidence), respectively. Other widely used measures of association to quantify the influence of specific factors on the occurrence of disorder are relative risk and related measures, used in cohort studies, and the odds ratio (OR), used in case-control designs. These measures quantify the likelihood of disease for exposed as compared to unexposed subjects.

Information on prevalence and incidence is needed to plan primary, secondary and tertiary prevention / treatment services. Information collected through epidemiological studies,

identifying risk factors for disease, may inform the etiology of disease as well as serve to focus service planning (Kleinbaum et al.1982).

Earls (1980) states there are two aspects to epidemiology, one related to service planning and the other to scientific enquiry. The services-related (descriptive) or administrative aspect of epidemiology is concerned with protecting the population from disease; it deals with the practical problems of preventing illness and its sequel. The scientific (analytic) aspect aims to identify the causes and etiology of disease so that prevention and treatment can be as effective as possible. This aspect begins with the assumption that diseases are problems, the answers to which are most likely to be found by viewing the individual in the context of the difficult social environment within which the disease develops.

Michael Rutter clearly described the current perspective on the epidemiology of child psychiatric disorders (1988). The first challenge is to describe and explain the psychopathological consequences of children's frequent failures to make age appropriate behavioural and emotional responses to environmental demands. The second challenge is to predict which children are at high risk of psychopathology, at what stages of development, and in which high-risk environments, and to control the rate of psychopathology in the community through developmentally appropriate interventions. Rutter not only emphasized the scientific aspects of epidemiology but also considered its role in service planning. He underlined the value of using interventions and service settings as natural experiments for testing causal chain mechanisms. In the future, preventive interventions will hopefully become an important aspect of epidemiologic research to: 1) limit psychopathology by providing appropriate services and 2) test hypotheses about the links between the risk and the outcome.

Communities in Iceland should be helped by providing reliable and valid measures of the need and availability of treatment. Politically, a national health program for children in every country is important. There is an urgent need for more information about the resources needed in Iceland to prevent mental disorders, and to care for mentally ill children and adolescents as early as possible, to prevent chronic disorder and co-morbidity.

4. CHILD AND ADOLESCENT PSYCHIATRY IN ICELAND

4.1. Current status

The practice of child psychiatry has existed in Iceland for only the past 30 years, beginning in 1970. The specialty requirements have since then been twice modified, in 1986 and 1997.

Beginning as "child psychiatry" but in 1997 the speciality was named " child and adolescent psychiatry".

For decades the main emphasis was on expanding clinical services. Today the main need is to promote the independence of the specialty within the hospitals and universities in Iceland. In 1999 there were eleven child and adolescent psychiatrists in Iceland. Most of them were trained in the Nordic countries, but three in the USA and one in Britain. In 2001 nine child and adolescent psychiatrists are working in the specialty in Iceland.

4.2. Development

As elsewhere the roots of child psychiatry in Iceland go back to psychology, paediatrics, psychiatry, pedagogy and the social sciences. During 1960-67 a Psychological Department for children was established under the auspices of the Reykjavik Department of Public Health and under the joint management of a psychologist, adult psychiatrist, pediatrician and social worker. The work of this department was primarily psychological investigation and individual evaluation of children, but it was also to give guidance to parents individually and to advise up-and-coming psychologists and educators. This mental health department was the first of its kind in Iceland to provide service for children and adolescents up to the age of 15 years. There was no child psychiatrist in the country at this time. During the years 1967-76 this mental health department remained under the Reykjavik Department of Public Health, with a "Healthy and Well Service" for children up to the age of five under the management of a pediatrician. During its existence from 1960-1976, 2100 children were seen at the child guidance clinic (Reykjavík Department of Public Health, 1976).

The first full-fledged child psychiatric department in Iceland opened in August 1970 at Dalbraut 12 in Reykjavik. It had been evident for many years that there were indeterminable child psychiatric problems and a great need for such a service in the country. Special reports on these

were sent to the Director General of Public Health from both paediatricians and psychiatrists. It was proposed that a child psychiatric department should be established under the auspices of the National University Hospital. In 1968 Social Affairs in Reykjavik began discussions between the city and state authorities concerning the establishment of a psychiatric department for children and adolescents and the outcome of these discussions was that both parties agreed to establish such a department within the University Hospital for children with mental disorders. In 1970 the first chief child psychiatrist was appointed. The service was in the first years connected to the department of paediatrics within the university hospital but functioned as an independent speciality, coming under the department of adult psychiatry division of the National University Hospital in 1983, and after that lacking its independence administratively. From the beginning the unit has been located at a considerable distance from the main hospital, and due to that the service has always been rather inaccessible. The unit consists now of an outpatient unit, an in-patient unit for children younger than 12 years and in 1987 an adolescent inpatient unit was established for adolescents, up to the age of 18 years. Older adolescents receive inpatient treatment in the division of adult psychiatry, or if they have drug or alcohol problems, at the National Hospital for Drug and Alcohol Detoxification (SÁÁ).

On May 3rd, 1980 the Icelandic Association of Child and Adolescent Psychiatry was established to promote the evolution and the development of the speciality and to organize its official annual meetings on training and continued education in the field. The association is linked to the International Association of Child and Adolescent Psychiatrists and Allied Professions (IACAPAP), the European Society of Child and Adolescent Psychiatrists (ESCAP) and the Icelandic Medical Association, and had in 2000 16 members, eleven of whom were certified in child and adolescent psychiatry; five were females. At the present time (2001) three are in resident training in child and adolescent psychiatry abroad and two are in Iceland. The Icelandic Medical Association has been a full member of the European Union of Medical Specialists (E.U.M.S.) since 1997.

The Medical Faculty at the University of Iceland advertised in 1999 for the first time a teaching position (25% lecturer position) in child and adolescent psychiatry. This position was supposed to be financed by adult psychiatry but that position has not yet been filled as of June, 2001. The administration of child and adolescent psychiatry and the teaching of medical students have been organized by the professor of adult psychiatry at the University Hospital, from the

beginning of the teaching of child psychiatry to medical students in 1974 but conducted by child and adolescents psychiatrists without teaching position.

4.3. Structure and organization of services

The University Hospital has a department of child and adolescent psychiatry within the adult psychiatric division. It is the only one of its kind in Iceland. Around 4,187 children are born annually in Iceland (Statistics in Iceland, 2000). The department comprises an outpatient unit, an inpatient unit for four to six children younger than 12 years, and after 1987, a unit for eight adolescents younger than 18 years. Earlier, a long term day hospital unit for six children existed, at which time the unit served autistic children, from 1970 until March 1996. The average length of stay for the inpatients service during the past ten years has been 65 days (Study III).

Iceland is divided into health care districts. In each district there is a central hospital or health care facility for specialized health care. In Akureyri, the capital of the north in Iceland, there is a child psychiatric outpatient service for children being build (July, 2001) connected to the pediatric department in the community hospital. Most health care districts have psychological services connected to the school authorities. Medical treatment is provided for by social security in Iceland, inpatient care at hospitals is free for children and adults. For outpatient service a limited fee is requested. An important milestone in child and adolescent psychiatry in Iceland was when The European Union of Medical Specialists (E.U.M.S.) acknowledged child and adolescent psychiatry/psychotherapy as a main speciality in medicine, in October in 1993 at a meeting in Copenhagen.

As of yet (July, 2001) Icelandic health authorities have not acknowledged child and adolescent psychiatry as a main speciality at the Medical Faculty at the University and in the University Hospital administration. The total budget from community and state to child and adolescent psychiatry in Iceland, was in 1997 \$ 1,937,000, only 7% of the money received by adult psychiatry or \$ 27,352,000 (Iceland's Financial Budget, 1997).

4.4. Outpatient service

Outpatient care has always been the primary mode of treatment for the child and the adolescent. Children are seen as outpatients for screening, diagnostic work-up and treatment with their parents, and often siblings. Teamwork of the specialists has been emphasized from the beginning of the outpatient service in 1970.

Outpatient consultations are usually carried out before it is determined whether admission to the inpatient ward is required. Referrals are from day-care centres or primary schools, psychological services of the schools, or the social welfare departments, the primary health care, MD's or parents themselves.

Outpatient child psychiatry is relatively well established in Reykjavik but with long waiting lists and limited consultative work in the three paediatric wards, other child/adolescent caring institutions and in the social sectors. An attempt has been made in child psychiatry not to overlook important biophysical factors in the evaluation and treatment process, by not focusing solely on socio-educational factors. The total needs of the child must always be considered first and foremost, with emphasis on continuity of care during the treatment process.

In crisis situations intervention through support is often enough, with family counselling or therapy in the outpatient department. The main focus has been on service to children within their families, following psychodynamic approaches and to communities and schools through family work. The working philosophy has been to consider individual needs and current problems - biophysical, intra-psychic, and within the family. Individual psychotherapy, art- and music therapy have been limited, but often administered with family counselling therapy and or psycho-educational treatment. The role of psychotropic drugs is explored and used more frequently in recent years if there seem to be indications for this, especially in ADHD, depression, or severe and frequent aggressive outbursts (Cantwell,1996).

During the past 25 years the principal mode of treatment has been a family therapy orientation, in the speciality originating at the outpatient service.

The main focus is on the mode of transaction among family members. Most of the therapists use more than one approach or theory in their practice. Behavioural therapy, cognitive therapy and hypnosis, have been on the increase among many therapists, especially among psychologists, nurses and social workers, and treatment with psychotropic medication among child and adolescent psychiatrists.

Consultations in child and adolescent psychiatry are carried out in the outpatient service, and the outpatient unit establishes the primary mode of treatment. In 2000, 6018 visits were made to the outpatient department at the University Hospital (Annual Report, 2000).

4.5. Inpatient services and personnel

During the years 1988-1998, 643 children and adolescents have been admitted to the two inpatient services in child and adolescent psychiatry in Reykjavík. Parents have not been admitted to the units together with their children except with very few exceptions. A staff of 163 make up the service team (2000), which is multi-disciplinary, currently consisting of 5 child and adolescent psychiatrists, 2 residents, 6 psychologists, 4 social workers, 17 nurses, one occupational therapist and 2.5 secretaries. Duties and responsibilities of the various disciplines have been defined in a handbook. The patient to staff ratio in the inpatient service has been 1:2.8.

In the 1990's there was increased discussion about the coordination of mental health services for children and adolescents, a breaking down of the walls between the hospitals and institutions and a bringing together of professional knowledge for the benefit of child and adolescent. The need for child psychiatric beds has been estimated to be about 4 beds for 10,000 children (Young JG, Ferrari P, 1998). According to this estimate there has been a considerable shortage of beds (in 1999 twelve beds). There has been an increased tendency among the Icelandic people in the past 5-10 years to view prevention and treatment of mental disorders of children as an issue of general public health.

4.6. Cooperation with other medical specialities

At the two paediatric wards in Reykjavík, daily rounds are not being carried out with participation of child and adolescent psychiatrists. In one of the two main paediatric wards in Reykjavik, psychological evaluations are more frequently asked for, than child psychiatric consultations on individual request by pediatricians. Cooperation with regard to these fields will hopefully develop more formally in the near future, in mental health, psychosomatic disorders and in neuropsychiatrics, as well as in the field of prevention at the "well baby" clinics. There has been no formal cooperation with the "baby-well" clinics and child psychiatrists.

Since 1985 there has existed an inpatient unit for school children with behavioural problems, directed by a social worker, attached to the department of adult psychiatry at the Reykjavík Hospital. This unit was, in January, 1998, connected to the Department of Child and Adolescent Psychiatry at the University Hospital.

Clinical meetings have been jointly arranged since 1983 with adult psychiatry at the University Hospital. Service for adolescents with alcohol and substance abuse has mainly been available at the National Hospital for Addiction Medicine (SÁÁ) and was given there to adolescents along with adult patients in treatment, until in January, 2000, a separate adolescent inpatient unit was established, for eleven adolescents.

The Diagnostic Center for Mentally and Physically Handicapped Children is under the Social Ministry. Since March 1996 this center has in addition been primarily responsible for the diagnosis and treatment of autistic children and adolescents. Before that autistic children were, since 1970, taken care of by the Department of Child and Adolescent Psychiatry. At the present time (in 2000) there is a lack of integrated treatment and diagnostic work between the Department of Child and Adolescent Psychiatry, SÁÁ and the Center for the Mentally and Physically Handicapped.

One child psychiatrist is developing a psychiatric service for children for the first time in the capital of the north of Iceland, Akureyri, within the district hospital, in connection with the department of pediatrics.

4.7. Cooperation with non-medical institutions and professionals.

Within the Government Agency for Child Protection and the Ministry of Social Affairs a service has been devoted to adolescents between 12-15 years, with behavioural problems and delinquency for the past 30 years. The service is staffed by teachers, pedagogs, social workers and a psychologist, and consists now of residential treatment homes for 45 adolescents. The service is primarily in charge of the day-to-day administration of 80 child protection committees in the country, according to laws on child protection.

In 1997 two communities developed, a temporarily service, for families with young problem children in Reykjavík. It was directed by a social worker and existed for only 2 years. Both these services suffered from the absence of child and adolescent psychiatrists on their permanent clinical staffs.

4.8. Research

An important turning point in regard to research took place in the early 1980s, when the first Nordic Child Psychiatry Research meeting was organized in Finland in 1982 with professor Sir Michael Rutter and since then research meetings have been organized in all five countries every 2-3 years. These meetings have increased and stimulated academic research in child and adolescent psychiatry, in all five Nordic countries.

Research funding has been limited, and research work in the field has mainly been on a voluntary basis in the past years, probably due to the lack of an academic chair in the speciality at the single Medical Faculty in Reykjavík. There exist five universities in Iceland, and in at least three of these child psychiatry is taught by qualified child psychiatrists but not holding teaching positions.

There have been few publications on child psychiatric epidemiology in Iceland.

At the time the present dissertation was begun, there was no data on the prevalence and distribution of child mental health problems across age and disorder spectrums, for representative population samples for the entire country. Björnsson (1974) was the first epidemiological investigation of mental disorders of children aged 5-15 years living in Reykjavík. The study estimated the frequency of mental disorders of children and their socio-economic and educational correlates.

Because of limited research in child psychiatry, there was plenty of justification for designing studies, to define and determine the degree and type of child and adolescent psychiatric disorder, in the Icelandic population, and to describe treatment resources.

In 1997 the CBCL was standardized in Iceland (Vikarsson et al.).

5. CLASSIFICATION METHODOLOGY

5.1. Overview of Classification Systems.

Classification of psychiatric problems in children and adolescents into categorical diagnoses has been controversial. Factors such as symptom intensity, number of symptoms and level of

functional impairment, need to be weighed and evaluated before a final decision on diagnosis is reached (Achenbach, 1995). Three general approaches to the classification of disorders have been identified: categorical, dimensional and ideographic (Werry, 1985).

The categorical approach, sometimes regarded as the medical model of classification, views disorders as either present or absent (e.g., the patient does or doesn't have appendicitis). This approach assumes that cases exhibiting a given disorder, display certain similarities, that these similarities outweigh differences, and that this knowledge has certain implications for the understanding of pathophysiology, course, treatment, and so on.

Unlike the dichotomous categorical approach, the dimensional approach to classification relies on the assessment of dimensions of function or dysfunction, by reducing phenomenae to various dimensions along which a child can be placed. Various sources of data can be used, such as behavioural ratings, parental reports, yes/no criteria, developmentally based test scores, and the like. Although the dimensional approach is more commonly used in nonmedical settings, many medical phenomenae also exhibit continuous (i.e. dimensional) characteristics (e.g. short stature, hypertension). For some purposes, categorical diagnoses (e.g. levels of mental retardation) are derived from what is essentially a continuous variable, while some dimensional assessment instruments can similarly be used to generate categorical diagnoses (Werry, 1985).

Ideographic classifications reject simple labels, and focus on the total context of the child's life in formulating a case; these classifications may be theory-driven (e.g. by psychoanalytic or behavioural theories), or eclectic ideographic approaches are commonly used in clinical work. That is, the child or adolescent is viewed in the totality of his or her life circumstance. Disorders, problems, and psychosocial situations are identified.

5.2. Categorical Classification System

The most widely used "official" systems are those proposed by the World Health Organization (ICD-10,1992) and the American Psychiatric Association (DSM-IV,1994). Both systems have undergone revision and have their historical origins in medicine.

During the 19th century, advances in the taxonomy of child and adult psychiatric disorders were made. In particular, Kraepelin's attempt (1883) to outline a comprehensive classification system stimulated considerable interest in diagnosis and taxonomy, and his emphasis on phenomenological descriptions was a marked advance. By the mid-20th century, a number of

psychiatric disorders were generally recognized. Many were included in both the World Health Organization's 1948 International Classification of Diseases Manual (ICD-6) and in the first edition of the DSM, which appeared in 1952. Both the ICD and the DSM have undergone various revisions.

Since the DSM-III was published, the number of disorders first evidenced in infancy, childhood, or adolescence had increased over 4-fold, to include the following major classes of disorder, each of which included a number of specific diagnostic categories: mental retardation, specific developmental disorders, attention deficit disorder, conduct disturbance, eating disorders, stereotyped movement disorders, pervasive developmental disorders, other disorders with physical manifestations, and other disorders of infancy, childhood, or adolescence (Mattison and Hooper, 1992).

In the DSM-III (now DSM IV), disorders generally specific to childhood were grouped together, and there were numerous subcategories. The complex issue of comorbidity (Rutter and Tuma, 1988) is treated differently in the ICD-10 and the DSM-IV. Despite obvious points of difference, the ICD and the DSM systems are more alike than different (Werry, 1985). The provision of detailed diagnostic criteria for essentially all mental disorders in the DSM-III marked a major advance (Cantwell et al.,1979). The various official diagnostic systems became less theoretical and more empirical. For example, field trials were used in the DSM-III to examine aspects of diagnostic reliability (Cantwell et al.,1979); other reliability studies have also appeared (Mezzich et al.,1985). The reliability of the ICD-9 has also been examined (Gould et al.,1988). Detailed critiques of the various diagnostic approaches have appeared (Achenbach, 1980; Rutter and Shaffer, 1980). Criticisms have been made of both the framework and its specifics. In the DSM-III in particular, categories were introduced on the basis of rather limited data. The reliability and validity of at least some of the various categories proposed (e.g., childhood-onset of pervasive developmental disorder) were questionable. Reliability is generally best for the more common and more broadly defined disorders. Information on the stability of the various childhood diagnoses is limited.

5.3 The dimensional approach

5.3.1. General considerations

An important area of investigation in past decade focuses on measurement of psychopathology through instrument development (Cornsweet 1990). Broadband checklists of symptomatic behaviour have been developed (Rutter 1967, 1970; Achenbach & Edelbrock 1983, 1986; Achenbach 1991). These checklists have been applied to both out- and inpatient populations (Costello et al 1991).

Furthermore, some additional instruments for assessing one specific disorder, or problems such as depression, suicidal and assaultive behaviour have been developed (e.g. Kovac,1984).

Several structured interviews to determine a reliable diagnosis and to yield ratings of functioning have been developed for use in clinical, teaching and research settings (e.g. Costello et al. 1985). Shaffer et al. (1983) developed the Children's Global Assessment Scale and DISC for children and parents which are designed to rate overall functioning and to pin point diagnoses (Shaffer et al.1996).

Direct assessment of children via observation in natural settings, clinical interviews, and structured self-reports provide additional perspectives for which Achenbach et al.

(1983) developed empirically based scoring systems, whose findings can be compared with those obtained from parent- and teacher- reports. Comprehensive assessment of children should also employ standardized tests of ability, achievement, perceptual-motor functioning, and speech / language skills, as well as relevant medical diagnostic procedures.

Dimensional approaches are in contrast to the more clinically oriented (categorical) approach. Multivariate dimensional approaches to diagnosis offer several potential advantages, in that various behaviour and aspects of behavior are assessed rather than single, presumably pathognomonic, features (Achenbach,1988; Achenbach and Edelbrock, 1979; Quay, 1986). Various rating scales, checklists and so forth are used for multivariate classification schemes based on self, parent or teacher report or on direct observation. Many such instruments have been described in subsequent years. Various statistical techniques such as factor and cluster analysis may be used to derive relevant clinical patterns or profiles. These patterns may, in turn, be used to derive categorical diagnoses. Given the inherent problems in sample selection and instrument development, issues of replication are particularly important (Rutter and Gould, 1985). The CBCL was developed to serve as one component of empirical assessment. Other components include teacher reports, standardized tests, physical assessment, and direct

assessment of the child, such as observations, interviews, and structured self-reports (Achenbach,1991).

Jenkins and Glickman (1946) and Hewitt and Jenkins (1946) were among the first to examine patterns of relationships (correlations) among sets of variables, to derive syndrome groupings. A large series of case records was studied, and the presence/absence of specific behaviours was noted for each case. Clusters of deviant behaviours were noted, and broad patterns of disturbance (socialized delinquent, overinhibited, unsocialized aggressive) were identified. Subsequently, more sophisticated methods have been applied to a range of children using a variety of assessment instruments (Achenbach, 1988). Studies done using this approach have generally identified several factors with relative consistency, including conduct disturbance, overactivity, and emotional disturbance (Achenbach et al., 1989, Rutter and Gould, 1985). Not surprisingly, the stability of more narrowly defined factors has been less robust. Similarly, as might be expected, such techniques have had limited utility in detecting children with disorders of very low prevalence.

5.3.2 Factor analytic approach

At the level of symptom groupings or syndromes, factor analysis has been used in a number of studies (Achenbach,1978; Langner et al.1976). Factor analysis is a multivariate statistical approach in which items are grouped together that inter-correlate highly with one another. In this way, mostly by applying checklists with a number of specific items to large representative clinical and non-clinical populations, empirically derived syndromes are obtained. In their review, Achenbach et al. (1983) compared empirically derived syndromes from diverse samples studied, and found that 14 narrow-band syndromes and 4 broad-band syndromes had counterparts in different samples.

The multivariate statistical approach has advantages but also disadvantages. Results depend on the statistical technique, the scoring of data, the number and content of the items, and the number, sex and age of the subjects used for the analysis. Therefore, they are liable to variation. However, experience with the technique and its application is expanding.

Comparison of existing data with data on different samples and the external validation of empirically derived syndromes, will eventually demonstrate the usefulness and limitation of this approach. The strong advantage of the empirical approach is that it facilitates qualitative

judgements about a child's behaviour in a quick and relatively inexpensive way. For the study of large populations, as in epidemiological research, the advantages are obvious. Furthermore, factor analysis renders it possible to make judgements on a more "molecular" level. For instance, a child not scoring in the pathological range when summing up all behaviour problem items might score in the pathological range for a specific factor, such as hyperactivity.

Achenbach et al. (1983) have linked this research approach with the practical use of empirically derived syndromes. The authors constructed the Child Behaviour Profile, a standardized profile for portraying and categorizing behavioural disorders and competencies. Taking age and gender into account, they factor-analyzed large samples of checklists filled out by parents (CBCL) or teachers (TRF), of children treated in mental health settings. Behaviour problem scales were then constructed, using the factors derived through factor analysis, and the scales were normed by obtaining checklists from parents and teachers of randomly selected children who had not received mental health services in the previous year.

As outlined by Achenbach (1991), the Child Behaviour Profile is widely utilized, not only for research purposes but also in mental health settings, as an aid to diagnosis, and for accountability and planning. In epidemiological research, the Child Behaviour Profile could be extremely valuable for case registers: systems of uniform data collection on all people treated for services within a delimited area. The judgement of the child's current functioning in relation to what is normal for his or her age, of the degree of handicap, and of the persistence of the behaviour, is based on the clinical knowledge, experience and skill.

5.3.3. The structure of Child Behaviour Checklist/4-18(CBCL), Child Behaviour Checklist/2-3 and Youth Self Report (YSR).

The CBCL was developed by Achenbach & Edelbrock in 1983 and is a checklist that provides standardized descriptions of behaviour and emotions and is designed to collect data on a wide variety of behaviours that are of clinical concern, rather than being diagnostic inferences.

The primary reason for developing the CBCL was the lack of well validated taxonomic and diagnostic constructs for childhood disorders (Achenbach, 1991).

The CBCL/4-18 is the instrument on which the other instruments CBCL/2-3, TRF and Youth Self Report are based. An earlier edition of the CBCL/4-18 was the CBCL/ 4-16, but the most current edition has been extended to age 18 (Achenbach,1991).

The instruments were designed to tap competencies and problems quoted by parents, teachers and youths respectively, and the majority of the problem items on the instruments parallel each other, although some items are instrument specific. The list also contains a social competence scale and reports of special class placement, and of repeating grades, as well as and open ended questions for describing other school problems and physical problems. The CBCL/4-18 contains 4 pages and instructs parents to score each of the behaviour/emotional problem items by circling 0 = not true of the child; 1 = somewhat or sometimes true; 2 = very true or often true.

The CBCL/4-18 consists of two parts: 20 social competence items in terms of activities, sports, non-sport activities, social relations and school function, plus 118 behaviour and emotional problem items, each scored on a 3-point. In addition, parents are asked to specify how well their child gets along with siblings, other children and parents, and how well the child can stay and work by himself/herself. Questions concerning academic performance were: current school performance, special class attendance, grade repetition and other problems in school. The lists have additional open items for problems that have not been mentioned, such as physical problems without known medical cause. The score behaviour describes the child within the past six months. The total behaviour problem score is calculated by adding up all 1's and 2's scored on the 118 items for each individual. The CBCL/4-18 gives a total behaviour problem score and two broad-band subscale scores, Externalizing (E) and Internalizing (I). The E-scale includes variables such as aggression, disorderly conduct, delinquent behaviour, hyperactivity and cruelty, while the I-scale includes variables such as depression, anxiety, withdrawal and somatizing. Subtracting the I-score from the E-score gives a measure of psychological style (E-I score) which has been found to illustrate the child's tendency to internalize or externalize. The instrument includes age and sex specific cut-off points for the limit of the normal range functioning, based on the analyses of clinic and nonclinic samples by Achenbach & Edelbrock (1983, 1991). Its validity and reliability are well documented in the U.S.A. (Achenbach & Edelbrock 1983; Achenbach 1991), in the Netherlands (Verhulst et al. 1985a,b), in a Norwegian sample (Növik, 1999) and in Finland (Almqvist et al. 1988).

The CBCL/4-18 has been translated into 51 different languages (in 1999) and numerous studies, including a number of current epidemiological surveys, have made use of the CBCL and related

instruments. Various forms of reliability and validity, including cross-cultural validity on cross-cultural research are documented, and have supported the usefulness of the instruments.

The CBCL/2-3 is filled out by the parents of the child ages 2-3 years and consists of 99 items on behavioral and emotional problems and 1 additional item in 2 pages. Respondents are requested to rate the items that describe the child now or within the past 2 months, as 2 if the item is very true or often true of the child, as 1 if the item is somewhat or sometimes true, and as 0 if the item is not true of the child. The CBCL/2-3 includes Total Behaviour score, two broad-band syndromes, Internalizing and Externalizing, and six narrow-band syndromes. There is an assumption that the behaviours assessed with such scales have normal distributions in the population. Furthermore, data obtained with the CBCL can be both hand scored and computer scored on the Child Behaviour Profile, a standardized profile for portraying behavioural disorders and competencies. Using epidemiological methods, the CBCL has been normed in several countries, and twice for the American population of children 4 through 16 years (Achenbach,1991).

The YSR is designed to obtain 11-18-year-olds' report of their own competencies and problems in a standardized format. The subjects' knowledge of their own behaviour and emotions makes them potentially important contributors to the assessment process. The structure of the YSR is based upon the structure of the CBCL, and it includes many of the same items as the CBCL/4-18 and the TRF. Adolescents are cognitively better equipped to provide reports of their own feelings and behaviour across situations than are young children. The YSR was developed to obtain adolescents' views of their own functioning, in ways that would facilitate comparison with other assessment procedures, such as the CBCL/4-18 and TRF.

The YSR is viewed as one component of an approach to assessment that employs data from multiple sources, such as parents, teachers, tests, physical assessments and interviews. This approach is called multi-axial assessment to emphasize that multiple sources of data should be used.

Achenbach published in 1991 an Integrative guide, a development of Cross-informant syndromes for the CBCL/4-18, YSR and TRF profiles. Definitive criteria did not exist before, against which to validate measures of childhood problems, but it is essential to preserve the contributions of different informants, even if they do not correlate well with each other. Low

correlations between informants may indicate that the target variables differ from one situation to another, rather than that the informants' reports are invalid or unreliable (Achenbach, 1991).

5.3.4. *Validity.*

Validity concerns the accuracy with which a procedure measures what it is supposed to measure (Costello et al.1988; Streiner,1993). Validity, like reliability has multiple facets, but traditionally includes three different dimensions: Criterion, construct, and content validity, which is the most elementary form of validity. The Manuals for the CBCL and TRF (Achenbach, 1991a, c) provide evidence of construct validity for CBCL and TRF syndromes, in terms of significant correlations with syndrome scales derived from other instruments. However, the lack of instruments resembling the YSR, currently limits the possibilities for testing construct validity in this way. Numerous studies have reported findings on relations between CBCL syndromes scales and other variables.

A scale has criterion validity when some property, most often a diagnosis according to a system that is considered as valid, a "golden standard", is correlated to the scale. The outcome depends on the choice of a cutoff point. However, validity should be considered a graded property, and recently ROC analysis has come into more general use in the study of validity, clarifying the trade-off between true and false positives, engendered in the use of cutoff points (Fombonne,1991; Kresanov et al. 1998). The concurrent validity of a scale (criterion) refers to its correlation with another scale, the validity of which is already established.

Content validity refers to 1) how the most important symptoms/phenomenae of the disorder, tap the items that comprise a scale which is supposed to measure, and 2) the factor structure of the scale.

Construct validity is perhaps the most discussed, but also the most elusive, form of validity. It was the lack of satisfactory constructs and operational definitions for childhood disorders which prompted the development of the CBCL, in order to assess parents perceptions of their children's competencies and problems. A key index of the validity of the resulting measures is their ability to identify children whose problems arouse enough concern to warrant referral for professional help. The key aim of the empirically derived syndromes is to provide common foci for practical applications, research, and training, based on sets of problems that have been found

to co-occur. The correlates of the syndromes identified through research, contribute to construct validity, in the sense of advancing the nomological network of which the syndromes are a part. Validity is also dependent on reliability, i.e. to which degree a particular scale performs the function it is supposed to do. Measures that pertain to reliability, are the internal consistency test-retest reliability, and for certain instruments (e.g. teacher rating scales) inter-rater reliability. A scale translated from one language to another or used in a different population, does not necessarily share the validity and reliability of its original. These properties need to be re-assessed (Streiner & Norman, 1995).

Longer -Term stability of scale scores has been found to be relatively high in longitudinal studies, using the CBCL (Achenbach 1991, Verhulst et al.1990).

In a recent Norwegian study (Növik,1999) on the validity of the Child Behaviour Checklist, the findings provided evidence for the external validity of the CBCL which supported earlier research in this field carried out in other countries (Crijnen et al.1997).

The predictive validity of the CBCL as judged by its ability to distinguish between children with psychiatric disorders and non-disordered children, were supported in Növik's study, also differences pertaining to sex, age, SES and degree of urbanization confirm findings of earlier studies across cultures.

5.3.5. Reliability.

The repeatability of a measure can be influenced by errors attributable to observer bias, subject's behaviour variation across time and place, and variation as a result of observer-subject interaction. Therefore, the reliability should be assessed for every instrument.

The most common forms of reliability reported in the literature of child psychiatric disorders are (O'Leary, 1979):

- a) Interrater (inter-interviewer) reliability defined as the likelihood that two scorers or observers looking at the same behaviour or same test protocol will arrive at the same score.
- b) Test-retest reliability defined as the likelihood of obtaining the same score on two occasions.

Reliability refers to agreement between repeated assessments of phenomena when the phenomena themselves remain constant. Reliability can be assessed and expressed in many ways. The most primitive approach is by computing the percentage of agreement. However, this can be misleading because a certain amount of agreement is to be expected by chance. When rating instruments such as the CBCL which are self-administered, it is important to know the degree to which the same informants provide the same scores over periods when the subjects' behaviour is not expected to change (the degree of test-retest reliability). Achenbach et al. (1983) reported intraclass correlation coefficients for the CBCL, as well as correlation coefficients, in addition to t tests, as a measure for test-retest, interparent and inter-interviewer reliability.

The CBCLs syndrome scales were derived from principal components analyses of the correlations among items. The composition of the scales is therefore based on *internal consistency* (or "split-half reliability") among certain subsets of items. This refers to the correlation between half of a scale's items and the other half of its items. *Alpha* represents the mean of the correlations between all possible sets of half the items comprising a scale, and is displayed for each scale in Appendix (Achenbach,1991).

To assess the reliability of CBCL item scores, the intraclass correlation coefficients (ICC) from one-way analyses of variance were computed (Achenbach,1991). The ICC can be affected both by differences in the rank ordering of the correlated scores and differences in their magnitude. The Pearson correlation mainly reflects differences in rank ordering. Agreement in rank ordering is especially important for some purposes, whereas agreement in the magnitude of scores is important for other purposes. The range of scores for individual items is small (3 points for all problem items and most competence items).

CBCL data has been published on inter-interviewer reliability of item scores from general population samples in home interview surveys in U.S.A., and on test-retest reliability of CBCL item and scale scores obtained when parents independently completed CBCLs, at a mean interval of 7 days (Achenbach,1991). The test-retest reliability of CBCL scale scores was

supported by a mean test-retest $\gamma = .87$ for the competence scales, and $.89$ for the problem scales over a 7-day period. The test-retest reliability in a Dutch study was $.79$ (Koot et al.1991). Over 1- and 2-year periods, changes in mean scores did not exceed chance expectations. Over a 2-year period, the mean γ was $.56$ for competence scales and $.71$ for problem scales. The commonly found tendency for problem scores to decline over brief rating intervals was evident in the CBCL scale scores, but it accounted for a mean of only 2% of the variance in the scores. Good interparent agreement was indicated by mean γ s for competence scales ranging from $.74$ to $.76$ for the four sex/age groups and mean γ s for the problem scales ranging from $.65$ to $.75$. Differences in size of scale scores obtained from mothers and fathers did not exceed chance expectations. Odds ratios showed highly significant agreement between mothers' and fathers' ratings in classifying children as being in the normal versus clinical range on all CBCL scale (Achenbach, 1991).

As the best measure of interrater reliability for ordinal and interval scales (for instance a five-point scale for recording severity of psychiatric disorder), the intraclass correlation co-efficient is recommended (Tinsley,1975). This coefficient not only reflects differences in rank ordering of the scores such as the product-moment correlation does, but also differences in magnitude. Reviewing the literature of major contributions to child psychiatric epidemiological studies of the general population, it is rather surprising that some studies do not report any reliability measures. Percentage of agreement across scores was used in some earlier studies (Rutter et al. 1968).

5.3.6. Use of CBCL in Population Studies.

For population samples of children's behavioural/emotional problems, parents are usually a key source of data. To maximize the chance of obtaining representative data from parents, it is necessary to use standardized assessment procedures that are acceptable to parents, easy to administer, economical, brief, reliable and efficiently scored. The instruments should not be too narrowly restricted to predetermined concepts of disorders that are apt to change. The CBCL was designed to meet all the foregoing requirements (e.g., Achenbach & Edelbrock, 1981; Achenbach et al., 1990a; Achenbach et al., 1990b; Montenegro,1983; Verhulst et al., 1985; Weisz et al., 1987; Almqvist et al., 1988; Bilenberg & Hörder, 1998). The CBCL has also been

used to analyze relations between the prevalence of disorders and patterns of service utilization in general population samples (Sawyer et al. 1990). Comparisons can be made to determine whether rates differ for particular groups within an area, such as for children from certain neighbourhoods, or disadvantaged or handicapped children. Mental health agencies may wish to establish local norms for their catchment areas, to use as a baseline with which to compare children treated for services. Population studies in particular areas can also be used to determine base rates for parent-reported problems and competencies in those areas.

Research on individuals who are referred for services provides an important complement to population-based studies. Case registers for recording data on all cases referred for services within a particular geographical area can be valuable for obtaining clinical samples that are less biased than those of any single service. The CBCL can be requested from parents as part of the evaluation process in services participating in a case register.

Despite the variability resulting from different methods used in different studies, there has been remarkable consistency in the findings from CBCL studies of prevalence rates. Some were in the region of twenty per cent of children having at least one disorder that meets ICD-9 criteria or DSM-3-R criteria, and is associated with noticeable reduction in ability to function at home, at school or with peers (Costello, 1989). A recent study on longitudinal analysis of parent adolescent agreement on Internalizing and Externalizing problem behavior, showed that mothers and fathers showed high agreement, whereas parents and adolescents showed little agreement. Agreement was higher for internalizing than for externalizing behaviors. In general, adolescents reported more symptomatology than their parents did (Seiffge-Krenke et al. 1998).

Sourander et al. (1999) mentioned in their study that many adolescents in need of psychiatric assessment, do not receive appropriate help, because their problems remain unnoticed by adults, especially internalizing problems among girls.

5.3.7. Use of CBCL in clinical studies.

Studies among clinical populations are needed to establish the level of need for services. Often the need is defined on the basis of diagnoses. Research on individuals who are treated for services, provides an important complement to population-based studies. The CBCL can be used as part of the evaluation process in services participating in a case register for child psychopathology with systematic follow-ups of cases, in order to study the courses and

outcomes of disorders in association with other variables, such as initial case characteristics and types of service received.

In experimental conditions, the initial CBCL scores can be used as a baseline against which to measure change, by readministering the CBCL again after the experimental conditions and comparing pre- versus post-intervention scores for subjects receiving the different conditions (Achenbach, 1991a: Integrative Guide; Verhulst & Koot, 1990).

The CBCL has been used in service studies in several countries (Verhulst et al.(II) 1985; Achenbach et al.1991; Vignoe & Achenbach. 1997; Stanger et al. 1999).

5.3.8. *Cross-cultural studies with CBCL*

To advance the study of child psychopathology, it is important to calibrate assessment procedures across different countries and cultures. If similar procedures produce similar results in different cultures, this supports the cross-cultural robustness of the findings and the possibilities for integrating results from many countries. If different results are obtained from different cultures, by contrast, the findings may provide clues as to causal factors related to the cultural differences.

Coinciding with increased cross-cultural concerns about the prevention and healthy development of children, child mental health services are becoming more sophisticated in many countries. International advances in child mental health services and the need to meet cross-cultural mental health challenges, both argue for methodology that can be widely shared for clinical, communicative, training, and research purposes.

Assessment procedures that prove viable across multiple cultures can be used to determine the prevalence of particular problems within each culture. By using a particular assessment procedure to obtain epidemiological distributions of problems in a culture, we can derive norms for judging deviance among children in that culture, who are subsequently assessed by the same procedure. Norms with which to compare individual children, provide building blocks for mental health services within each culture.

In reviewing cross-cultural epidemiological research, Bird (1996) identified two approaches. One approach tabulates diagnoses based on the American Psychiatric Association's (1980,1987,1994) Diagnostic and Statistical Manual of Mental Disorders

(DSM-III, DSM-III-R, DSM-IV) or the World Health Organization's (1978,1992) International Classification of Diseases (ICD-9, ICD-10). The other approach uses empirically based standardized assessment instruments to quantify informants' reports of behavioural / emotional problems. The empirically based instruments reviewed by Bird were the CBCL/4-18, the TRF, and the YSR, on which parents, teachers, and adolescents rate similar problems (Achenbach, 1991a). Furthermore, cross-informant correlations between CBCL, TRF, and YSR scores did not differ significantly among the cultures from which each combination of scores was available.

As Bird pointed out, the empirically based approach has generated direct comparisons of problem scores across studies and cultures, in more standardized fashion than has the diagnostic approach. Methodological inconsistencies in the diagnostic approach stem from major variations in diagnostic systems, diagnostic criteria, assessment procedures, sources of data, and the aggregation of the data.

Most cross-cultural studies have compared just two cultures at a time. Significant differences have been found between problem scores in some pairs of cultures, but a review of published studies has revealed a relatively small range of scores from CBCL's in 12 cultures, TRFs in 6 cultures, and YSRs in 3 cultures (Crijnen et al.1997).

Problems reported by parents of 15,871 children in 12 cultures study across ages 6-11 supported the above results by using metaanalysis. Effect sizes were expressed as the percentage of explained variance, and they are interpreted according to Cohen's criteria as small, medium, or large. Bonferroni corrections were applied to correct for the number of comparisons actually made, by calculating confidence intervals for the deviations of the parameters from the overall mean. On six syndromes, significant age effects were found, but effect sizes were small (1%) for aggressive behavior, to very small (less than 1%), for other syndromes. On five syndromes, significant gender effects were found. These effect sizes were small (1%) for attention problems and delinquent behavior, and very small for the other syndromes. Cultural differences accounted for small effect sizes on the somatic complaints (5%), anxious/depressed (5%), thought problems (3%), delinquent behavior (1%), and aggressive behavior (5%) syndromes. Findings for 6-11 year-olds across 12 cultures were generally similar to those of the nine-culture comparisons. In both the nine-culture and 12-culture comparisons, Puerto Rico scored consistently above the omnicultural mean, whereas Sweden and Germany scored consistently

below the mean. Other cultures showed less consistency across the eight syndromes. Age and gender variations among syndromes scored from parents' ratings were quite similar across the 12 cultures. However, there were significant cross-cultural differences in the overall magnitude of scores on certain syndromes (Crijnen et al. 1999).

Detailed CBCL epidemiological data have been reported from Canada, Chile, Thailand, China, Singapore, Holland, France, Germany, Iceland (Study I), Sweden, Denmark, and U.S.A. (Crijnen et al. 1999) and Norway (Növik, 1999). The results from all these countries have been remarkably consistent in that girls obtained a mean total problem score slightly below that for boys. On the contrary in a Norwegian study (Kvernmo & Heyerdahl, 1998) on the influence of ethnic factors on behavioral problems in indigenous Sami and majority Norwegian adolescents, rates of behavior problems in both ethnic groups were generally high and highest among girls, especially Sami girls. Ethnic factors seems to have had a significant impact on behavior problems in this study. The authors state that the high problem rate could be due to the multiethnic context of these adolescents. Another factor that may have contributed to the difference in the problem scores is a difference in socioeconomic status of the parents, like between the Puerto Rican (low socioeconomic status) and the Swedish sample which was of relatively high socioeconomic status.

Translations of the empirically based instruments in 51 languages, publications of findings from 36 cultures, and comparisons between many pairs of cultures are contributing to a cross-culturally robust methodology for mental health workers (Crijnen et al. 1999). A compelling next step would be to integrate findings from multiple cultures more rigorously and more comprehensively to understand better how to prevent problems internationally and cross-culturally. Integrative multicultural metaanalysis seems to provide a clearer overview than can pairwise comparisons of cultures.

6. AIMS OF THE STUDY

- 1.** To provide data on emotional and behavioural problems in the Icelandic population of children/adolescents aged 2-18 (Study I).

2. To identify differences in demographic background factors in general population and children and adolescents who have undertaken psychiatric treatment(e.g. sex, age, SES). (Studies I,II,III, IV).

3. To compare Icelandic CBCL 2-3 data with data from Finland (Study II).

4. To describe characteristics of outpatients in child / adolescent psychiatry in Iceland in relation to treatment modality (Study III, IV).

5. To describe the use of the YSR in clinical samples and to compare scale scores to those of the general population (Study IV, I).

6. To describe psychosocial functioning and the frequency of comorbidity of adolescents treated for alcoholic and narcotic problems (Study IV).

7. SUBJECTS AND METHODS

7.1. Subjects and procedures

Studies I through IV and the subjects included therein.

7.1.1. Study I

The general population sample of 2,040 children and adolescents was drawn in April 1991 from one urban and three rural environments in Iceland. The years of birth under study were from 1973 to 1989. Population data were found in the publications of the Statistical Bureau of Iceland (Statistics of Iceland,1988). The sample was stratified according to year of birth. The years of birth under study were from 1973 to 1989. A stratified random sample was drawn of 120 children, 60 boys and 60 girls in each age group, from Reykjavik. The surrounding towns are defined as urban, with the rest of the country defined as rural. The sample was selected at random from one urban and three rural environments in the south, west and north of Iceland, using census tract data from the whole population. The children were almost equally distributed

between urban and rural environments; 48.8% were from the urban area and 51.2% from the rural areas.

Of the 2040 children receiving the questionnaires 1324 parents (64.9%) completed CBCL data or 624 (61.2%) from urban areas and 700 (68.6%) from rural areas. The respondents were 91.4% mothers, 8.4% fathers and 0.2% others. There is no difference in the age of the mothers who answered and who did not, or in their place of residence.

The socio-economic status of the children in the sample was based on the parent's occupation. In addition to this analysis, the mean total behaviour problem score for 4-16 year old children was grouped together with the socio-economic status of the parents.

The adolescents in the *age* group eleven to eighteen years received the YSR through their school and their parents were asked to fill in the CBCL. The seventeen and eighteen year-old adolescents received the YSR by the mail if they did not attend school.

7.1.2. Study II

The Icelandic sample was drawn from the city of Reykjavik in 1997. The sample was from the general population, and stratified according to the year of birth. The CBCL 2-3 was sent to 240 parents, there of 120 boys and 120 girls. The response rate was 68%, with 94% of the respondents being mothers and 6% fathers. The mean age of the children was 2.4 years (SD 0.5).

The Finnish sample consisted of all children born in 1992 and 1993 residing in the designated district of Åland, Finland. Åland is an archipelago area with an almost completely Swedish-speaking population situated between Finland and Sweden. All parents attending the child's 2 or 3-year check-up at well-baby clinics in 1995 were asked to fill in the CBCL questionnaire before the scheduled appointment with a nurse. All the well-baby clinics in the study area took part in the study. Altogether 330 parents filled in the Swedish version of the CBCL questionnaire, accounting for 56% of the target population of children born in 1992-1993 in Åland. Of respondents, 95% were mothers and 5% fathers. The mean age of the children was 2.5 years (SD 0.6).

7.1.3. *Study III*

The subjects were all the patients seen at the outpatient clinic of the child and adolescent unit in Reykjavík, Iceland, during the 4-year period 1973 to 1976 (n=702) and the 2-year period 1987 to 1989 (n=311). In 1973 to 1976 diagnoses were made in accordance with ICD-8 (WHO,1974), but in the later period ICD-9 (WHO,1978) diagnoses were used.

To make diagnoses comparable, all the 1973-76 records were reviewed (by H.H.) in accordance with the ICD-9. The reviewer (the author) had been the patient's child psychiatrist or consultant in the clinic in many instances.

7.1.4. *Study IV*

The level of self-reported problems were estimated by applying the YSR for hospitalised adolescents with substance abuse problems, at the department of Addiction Medicine, Vogur. The study group consisted of all adolescents aged 12-18 years referred and admitted in 1995-1997. There were 63 boys (61%) and 40 girls (39%). The response rate was 100% in the hospitalized group but only 51.7% from the general population.

The adolescents were systematically assessed for alcohol and drug related problems. Medical history (anamnesis) and symptoms were obtained by routine clinical interviews by physicians, and the application of DSM IV diagnostic criteria. The YSR was administered by a research assistant or physician at the end of a ten day stay at the hospital. Data was also collected from the adolescents on the family use of alcohol. At the end of treatment, each of their charts was read and reviewed by the author (H.H.) and they received the DSM IV diagnoses. The comparison group was obtained from an earlier general population study (I).

7.1.5. *Identifying cut-off points for the Icelandic CBCL*

The study sample consists of 329 child/adolescent psychiatric outpatients (boys =196; girls =133), treated during 1987-1989 at the University Hospital in Reykjavík (unpublished data). Each child/adolescent had been seen by the (first) author of the study and was clinically interviewed and diagnosed according to ICD 9. None of the parents refused to fill out the

questionnaire. The mean age was 9.3 years for the boys (SD 4.4) and 10.8 years for the girls (SD 4.5). In 1995 each chart was read and reviewed by the author (H.H.).

The general population sample of children and adolescents had been selected randomly from one district of Reykjavik and three rural areas in Iceland in 1991. The response rate for the general population sample was 62%. (Study I). The optimal cutpoint was found by ROC analysis.

7.2. *Measurements.*

7.2.1. *CBCL /2-3, CBCL/4-18, YSR/11-18.*

The CBCL/2-3 consists of 99 items on behavioural and emotional problems (or 99 questions), and one additional item. Respondents are requested to rate the items which describe the child now or within the past 2 months, as 2 if the item is very true or often true of the child, as 1 if the item is somewhat or sometimes true of the child, and as 0 if the item is not true of the child. A syndrome score is the sum of scores on all items included in the syndrome scale, as defined by Achenbach (1991).

The CBCL/2-3 includes Total Behaviour Score, two broad-band syndromes, Internalizing and Externalizing, and six narrow-band syndromes. This questionnaire contains 2 pages, and is based on the CBCL for ages 4-16 years (Achenbach et al. 1987b).

Child Behaviour Checklist /4-18: Includes 20 items for assessing competency in terms of activities, sports, non-sport activities, social relations and school functioning, ratings for academic performance plus 118 behaviour and emotional items. The list contains 4 pages, reports of special class placements and repetition of grades, and open ended questions for describing other school problems, and physical problems. The CBCL/4-18 includes the Total Behaviour Score, and two broad-band syndromes, Internalizing, the sum of scores on items in the withdrawn, somatic complaints, and anxious/depressed syndrome profiles and Externalizing, which is the sum of scores on the delinquent and aggressive syndromes. The CBCL /4-18 instructs parents to score each of the behaviour/emotional problem items by circling a 0 = not true of the child; 1 = somewhat or sometimes true; 2 = very true or often true.

The YSR /11-18 contains 17 items for assessing competency in terms of activities, sports, non-sport activities, social relations and school function, ratings for academic performance plus 103 behaviour and emotional problem items, most of them comparable to CBCL 4-18. The 16 remaining items are social items that replace CBCL items which are inappropriate to ask adolescents. The list also contains open ended questions for describing worries, physical problems and “things they are good at”. The behaviour/emotional items are rated in the same way as in the CBCL on a 3-point scale. The YSR includes the Total Behaviour Score, and two broad-band syndromes, Internalizing and Externalizing.

7.2.2. Diagnostic and other procedures

Children seen in consultations in Studies III and IV were diagnosed according to the author’s clinical experience and judgement, and as to whether the child was hospitalized then psychological testing were often used. ICD –9 or DSM-IV diagnoses were most often made within the first three to four weeks of the first interview or before the third outpatient visit.

All questionnaires contain items concerning parents’ occupations, and children’s age, sex and residence. The socio-economic status is determined by parental occupation and the lowest SES is coded 1, and the highest as SES 6 (Hollingshead,1975).

7.3. Translation of the questionnaires into Icelandic

The CBCL questionnaires were translated into Icelandic by two non-medical linguists in order to correspond as precisely as possible to the same behaviour as in the American version of the checklists. The Icelandic version was translated back into English in order to check on the accuracy of the translation. The two Icelandic versions were quite comparable and only three words had been altered from the original translation.

7.4. Ethics and Informed Consent

Letters and checklists describing the purpose of the study were sent to the parents and adolescents (11-18 years old). In the letter the importance of participation, and of each question

being answered, was stressed. Also given was the phone number of a contact person if the participants needed help in filling out the questionnaires. Several hundred people made contact by phone for further information. And written permission was received in advance from all parents. After the permission from parents was granted the questionnaires were distributed in April 1991 through schools to children aged from 11 to 16 years, but mailed to other participants. The 11-16 year old group was given the questionnaire in school and was responsible for bringing the letter and checklists to its parents. The first reminders were sent to all parents and adolescents three weeks later, and the second along with a copy of the questionnaire to those who had not yet responded.

Ethical guidelines for this research work are those formulated by the Icelandic Data Protection Commission and the Medical Ethics Committee of the University Hospital for the Sciences and Humanities. The individual studies that compose the dissertation were approved by both organizations.

The parents and adolescents that participated in the general population study gave informed consent after reviewing written information about the study. Hospitalized participants gave informed consent during the interview, based on verbal information given by the interviewer. Parents have been kept informed about the results of the general population study as well as the results of the patient group, via news media in Iceland and scientific meetings and conferences.

7.5. Statistical methods

The following statistical methods were used in studies I-IV: chi-square test, t-test, analysis of covariance (ANCOVA), and two-way analysis of variance.

P-values < 0.05 were interpreted as significant if not otherwise specified. The statistical methods are described in detail in the papers. The choice of methods was guided by the statistical collaborators. In papers I, III and IV the Statistical Package for the Social Sciences (SPSS, windows) was used. In paper II the analysis was performed with BMDP statistical software. Receiver operating characteristic analysis (ROC) was used to calculate sensitivity and specificity for all possible cutoff values of the CBCL, and to identify the Icelandic cutpoints as described by Vining & Gladish, 1992.

8. RESULTS

8.1. Emotional and Behavioural Problems in Children and Adolescents in Iceland (Study I).

The aim of this study was to test the applicability of a standardized procedure, the CBCL, for assessing Icelandic children's behaviour/emotional problems and competencies, and to identify differences related to demographic variables. The study focuses upon the method of using the Child Behaviour Checklist/2-3 (CBCL/2-3), Child Behaviour Checklist/4-16 (CBCL/4-16), and the Youth Self Report (YSR/11-18), to normal population children and adolescents to estimate the level of emotional and behavioural problems in children from 2-16 years of age, and the self-reported rate in adolescents from 11-18 years.

The CBCL/2-3 years, was completed by parents of 109 children, and the level of behaviour and emotional problems in Icelandic pre-school children for the general population turned out to be 27.5 (boys =29.2; girls =25.6).

The mean total behaviour problems score for the 2-3 year olds was slightly higher among 3 year old boys than girls. The difference was not statistically significant.

The present study data on behaviour and emotional problems in Icelandic children from the general population using the CBCL/4-16, for 943 children, is 17.7 (boys =19.5; girls= 16.2). The response rate was highest for the married mothers but lowest for the widows, and intermediate for the unmarried and divorced mothers.

Upper-SES parents reported fewer problems than lower-SES parents.

A comparison of respondents and non-respondents was made on those variables where information was available for both groups. The parents and adolescents who did not return the checklists, compared to those who responded, were more likely to be from the capital and from single-headed families.

The YSR/11-18 was completed by 546 adolescents or 61.9%. The mean total behaviour problem score among them was 31.5 (males 32.6; females 30.5).

The mean total problem score of adolescents self-reported behaviour problems for the general population sample, tends to increase with age among both sexes, except for 15 and 18 year old females, which may be attributed to the small sample size in these age groups.

After the age of 5 there was a slight rise in the mean social competence scores, declining again after the age of 12 among boys and after the age of 13 among girls. Girls generally scored higher than boys, except for the 6 and 7 year olds. This difference was statistically significant according to ANOVA.

The YSR/11-18 total competence score was calculated by adding the scores of all the competence items. The higher the score, the better the child is functioning. There was no clear sex difference. Older boys scored somewhat higher than older girls but due to the small sample size this was most likely biased.

In the *Appendix 16* are shown the percentages of specific behaviour problems from the general population study, grouped by age and gender, for whom each behaviour problem listed in the CBCL was reported by the parents (*Appendix 16.1./Figures 1-112*), and for whom each behaviour problem listed in the YSR was reported by the adolescents (*Appendix 16.2./Figures 1-111*). This is shown in order to visualize the frequencies related to age and gender to facilitate further research in the future related to CBCL and YSR.

8.2. Comparison of CBCL 2/3 scores between two samples of 2- to 3-year old children in Iceland and Finland (Study II).

The objective was to compare the behaviour problems of 2 to 3 year old children in Finland and Iceland. Parental information was obtained from 493 preschoolers in Åland, Finland and Iceland. The mean total behaviour scores in the two samples were rather similar in both countries. Boys had higher rates of externalizing scores ($p < 0.01$), on the aggressive behaviour syndrome scale ($p < 0.01$) and on the destructive syndrome scale ($p < 0.05$). There were relatively high rates of attention-seeking and poor concentration overall in both countries. The only significant difference between the countries was found in the anxious-depressive syndrome scale ($p < 0.001$), on which the Icelandic children scored higher. No significant differences between sexes were found.

The frequencies for individual items scored 1 and 2 ranged from less than 1% (overweight, smears bowel movements) to about 80% (can't wait, demands must be met). No significant differences were found between the countries in 71 items when boys were compared, and in 75 items when girls were compared. The items which scored 1 or 2 for 50% or more in both

cultures, can be regarded as reflecting quite common behaviours in this age group, while items that scored 1 or 2 for less than 10% can be regarded as reflecting uncommon behaviours cross-culturally. The items with high prevalence ($\geq 50\%$) for both sexes were: Can't wait, demands must be met, disobedient, doesn't want to sleep alone, easily jealous and wants attention. The items with low prevalence ($< 10\%$) for both sexes were: Sad, underactive, headaches, looks sad, overweight, withdrawn, worrying and little interest.

8.3. Characteristics of child and adolescent outpatients in Iceland (Study III).

In this study a comparison was made between patients seen in the outpatient clinic of the child and the adolescent psychiatric unit at the University Hospital of Reykjavík during the 4-year period 1973-76, and patients seen during the 2-year period 1987-89. The patients in the two periods, 1973-76 and 1987-89, are described by age and sex. The mean age for outpatients had increased by about 1 year, and the male to female ratio had decreased from 2.2 to 1.5.

From the number of patients in each age group and the corresponding number in the total population, the rate of service utilization (visiting the clinic at least once) per year for the population was calculated. The service rate has decreased for boys aged 0-14 years but has increased for boys 15-19 years old. For girls the service rate has decreased in the age group 0-9 years but increased for the 10-19 years old.

The patients seen in the clinic are predominantly urban; 69% in 1973-76 and 77% in 1987-89. All the decrease in service rate is in the service of patients living outside the greater Reykjavik area; from 0.13% in 1973-76 to 0.05% in 1987-89. There has been an increase in the number of patients living with one parent, from 18% in 1973-76 to 27% in 1987-89, corresponding to a similar increase in the population from 14% to 18% of families having one parent with children age 0-15 years.

Of the patients in 1973-76, 2% were referred by social authorities and 2% by school psychologists. In 1987-89 those had increased to 8% and 15%, respectively, with a decrease in number referred by a general practitioner or a pediatrician from 37% to 19%, and those who were self-referred from 50% to 40%.

Regarding the primary diagnoses (ICD-9) of the two patient groups there has been an increase in the number of conduct disturbances, emotional disturbances, and specific delays in development. There has been a decrease in the number of the diagnosis adjustment reactions.

There was no case of alcohol or drug abuse as primary diagnosis. The last group, other disorders, includes family disruption, mental and behavioural problems, chromosome anomalies, mild mental retardation, migraine, epilepsy, and alcohol or drug abuse.

Approximately 30% of the patients received more than one diagnosis, and 5% more than three diagnoses. The most frequent second diagnoses were "specific delays in development" and "disturbance of conduct".

8.4. Identifying cutoff point for the Icelandic CBCL (unpublished information).

The study consisted of 329 patients seen in consultations in the child and adolescent psychiatric outpatient settings in Reykjavík. Parents were asked to complete the CBCL at the beginning of treatment. The CBCL was scored, and each chart was reviewed by the author. An Applied Treatment Form (from Maudsley Hospital, London), was completed at the end of the study period, to detail what investigations and treatments each child/adolescent had received.

The behaviour problem scores were significantly higher for the treated boys (N = 196) in every age group as compared to the general population (N = 476). Although the mean score decreased with increasing age for the general population, similar relationships were not observed in the treated population. Behaviour Problem mean scores for treated girls (N = 133) were also significantly higher than for the general population (N = 466). All problem items between treated and general population children indicated higher scores for treated children with significant effect at a $P < 0.01$ level in ANCOVAs. The ANCOVA's were performed on the whole sample.

Misclassification rates are given in the tables below for different definitions of the cutoff points. Two definitions of cutoff points are used and the corresponding misclassification rates are given in tables I-III. The first definition, the optimal cutoff point, depends on both the normal population and the outpatients. The second definition depends only on the normal population, i.e. its 90th percentile. The cutoff point for this percentile is given for the raw score in Table II and for the T-score in Table III. The results summarized in those 2x2 tables as proportions, FP and FN, are measures reflecting the discriminating power of the screening test. False-positive (FP) is the proportion of healthy children that have positive signs and symptoms on the CBCL, and false-negative (FN), is the proportion of children with behaviour and emotional problems

that have negative signs and symptoms on the CBCL. The optimal cutoff point is selected such that it minimizes the sum of the FP and FN rates and is calculated for the raw score, see Table I.

Table I. Misclassification rates for the optimal cutoff point defined by ROC analysis.

Age	Boys				Girls			
	Controls/ patients	Cutoff point	FP	FN	Controls/ patients	Cutoff point	FP	FN
4-11	336/139	36	17%	24%	318/94	33	11%	26%
12-16	171/57	28	15%	14%	172/39	39	5%	21%

The minimal sum is found with the aid of the ROC analysis (Vining & Gladish,1992) which is a quantitative method for assessing the overall performance of an instrument for the full range of its scores. The optimal cutoff point shown in Table I is found with the aid of ROC analysis as detailed by Fombonne (1991), which is a similar procedure to Achenbach’s cutoff point identification.

In the age group of 12-16 years for girls, there is a discrepancy in the findings in the table. The cutoff point is expected to decrease with age, but not increase, as shown in the table. This is most likely due to too few patients in that age group (N=39), and hence unreliable or biased findings in this case.

Table II. Misclassification rates for the cutoff points corresponding to the approximate 90th percentile of total behaviour problem raw scores for the normal population.

	Boys	Girls
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Age								
	Controls/ patients	Cutoff point	FP	FN	Controls/ patients	Cutoff point	FP	FN
4-11	336/139	42	9.5%	34%	318/94	36	10%	33%
12-16	171/57	32	9.4%	21%	172/39	34	10%	18%

Table III. Misclassification rates for cutoff points corresponding to the 90th percentile of the normal population T-score.

Age	Boys				Girls			
	Controls/ patients	Cutoff point	FP	FN	Controls/ patients	Cutoff point	FP	FN
4-11	336/139	63	10%	34%	318/94	60	10%	29%
12-16	171/57	61	10%	22%	172/39	63	10%	18%

8.5. Psychosocial functioning and comorbidity among hospitalized adolescents with alcohol and narcotic abuse (Study IV).

The aims of this study were to provide YSR data of behavioural/emotional problems in a treated group of substance abusing adolescents, and to compare the results with YSR data from the general population. A further aim of the study was to examine psychiatric diagnoses among the substance abusing adolescents, and to study the family background of alcoholism among first and second degree relatives of the cases, through self-report from the adolescents.

The mean total behaviour problem score for YSR for the treated group of 16-18 years old is, 78.0 for males and 89.8 for females. The score is highest for 16 year old males or 93.0. The

mean total behaviour problem score for both sexes for 12-18 years old is 83.0. No significant difference was found related to sex, age or the combined sex* age effect on 2-Way Interactions in the treated group.

The mean total behaviour problem score for YSR for 16-18 years old by age and sex from the general population study, is for boys 32.3 and for girls 30.7. The mean total problem score for the YSR tends to increase with age among both sexes.

There is statistically significant difference on Externalizing and Internalizing scores with relative dominance of Internalizing versus Externalizing problems for treated adolescents.

Treated females score higher on both problems, especially on Internalizing problems.

The YSR total competence score was calculated, and the higher the score, the better the adolescent is functioning. There was no clear sex difference. Older boys scored somewhat higher than older girls. The general population group had a much higher social competence score than the treated group of adolescents.

Drug dependence alcoholism was diagnosed in 79.3% and drug dependence kannabis as 24.7%.

There was a total of 101 dependent adolescents and only 2 substance abusers according to DSM IV diagnoses. The most common psychiatric diagnoses were conduct disorder (44%), major depression (28%), post traumatic stress disorder (11%) and anxiety disorder (6%), personality disorder (4%), sexual abuse (4%), attention deficit disorder (3%), and dyslexia (1%).

Family loading to alcoholism in 1st and 2nd degree relatives of treated adolescents with narcotic and alcohol problems is 82.5% (both sexes), 85% for females and 80.9% for males, according to the reports given by the adolescents.

9. DISCUSSION

9.1. Methodological aspects

9.1.1. Study design

Study I is a population study based on cross-sectional data. Different age groups are included, and information obtained from different sources. The sample was stratified to the year of birth and according to urban or rural residence. The information was obtained by mailing checklists (CBCL) with a letter to parents of children 2-10 years of age. Schools distributed questionnaires

to parents of children 11-16 years. Adolescents 17 and 18 years old received the questionnaire (YSR) by mail.

The introductory letter to the participants was carefully formulated, containing an explanation of the importance and the purpose of the study, a clear and honest account of what was expected from the participant, and a statement ensuring confidentiality. A phone number to call for further information was given. Mailing checklists could be efficient alternatives or used in addition to the more direct ways of data collection, as was done in this study. Introductory procedures such as letters and phone calls increase the response rate (Miner, 1983). They also provide the researcher with the opportunity to introduce him or herself, as well as the research project. Controlled studies have proved telephone calls to be a cost-effective alternative to personal interviewing (Paulsen et al., 1988; Reich & Earls, 1990). This holds true for Study I, as three hundred and ten participants used the telephone number provided for further information. Two reminders were sent to the parents and adolescents and the second time around with a copy of the questionnaire to those who had not yet responded.

In Iceland, parents of children younger than 11 years old received the CBCL by mail. The drop out was higher through mail than through the school distributed questionnaires. Non experimental Dutch findings suggest that mail delivery yields somewhat lower mean problem scores than do home interviews, because high scoring individuals tend not to respond by mail (Verhulst et al., 1990). A lower rate of mail responses by parents of high scoring children is corroborated by higher problem scores according to French teachers' rating of children whose parents failed to return the CBCL, in contrast to children whose parents returned the CBCL (Stanger & Fombonne et al., 1994). Thus, it is likely that the mailing versus interview procedure has affected the results in various ways in the cross-cultural comparison. The high attrition rate in this study may also explain why the mean total behaviour problem score is rather low in Iceland. For 11-16 year olds in the Northern American CBCL study, parents responded to home interviewers, whereas the French parents sent their completed CBCL's to their children's schools, as in the Swedish study, and as partly in the Icelandic study.

In Study II the design was somewhat different in Iceland than in Finland. In Finland parents received the questionnaire at the “well baby” clinic, but in Iceland parents of children in preschools received the questionnaire by post.

The children and adolescents in Study III and IV were evaluated from multiple perspectives upon admission and during treatment. The present study design (III and IV) did not include

control conditions that would permit evaluation of the impact of hospitalization relative to outpatient treatment, or to any other, or no treatment at all.

The lack of an appropriate comparison group is a common methodological problem in studies of child and adolescent psychiatric in- and outpatient assessment and treatment. In many studies it has been looked upon as a threat to the validity of the findings. Furthermore, variables that may be significant for follow-up status after discharge were not examined in the present studies (III and IV).

9.1.2. Samples

The overall response rate in Study I was 62% for the CBCL/4-16 and 64% for the YSR. The response rate was lowest for the 2-3 year olds, 47%. Over 90% of the respondents were mothers. The children were almost equally distributed between urban and rural environments. The total number of refusals to participate in Study I was 35.1%. The low response rate could be due to the distributive procedure in the school, but also to the lack of manpower and finances to carry out so large a study. Usually non response in child psychiatric epidemiological research is associated with a higher proportion of problems, and the lower socio-economic background among the children and is an influence on the data collection procedure (Verhulst et al.,1990). The main way to avoid wrong conclusions due to non-response is to keep response rates as high as possible (Farrington et al., 1990). Unfortunately this was not possible in this study due to the above mentioned reasons. However the response rate in Study I is similar when compared to epidemiological studies of the same size in Iceland in heart and cancer research (Sigurdsson et al.1993; Jónsdóttir et al.1998).

The school population samples in Study I are considered to be representative for Icelandic children and adolescents. The sample is from urban and rural environments and contained more boys than girls, as does the sampled population.

In Study II the Finnish sample consisted of children born in 1992 and 1993. The Icelandic sample was drawn from the city of Reykjavík in 1997. The mean age of the children was 2.4 years (Iceland) and 2.5 years (Finland).The samples were stratified on the basis of the year of birth. 240 Icelandic parents received the questionnaire.The response rate in Iceland was 68%. In Finland 330 parents filled out the questionnaire, accounting for 56% of children born in 1992-

1993 in that area of Finland. Both samples are likely to be representative of their countries preschool children.

In these two studies the same general methodology was used as did Achenbach e.a.(1981) and Verhulst e.a.(1985) in their studies. The same instrument is used (Study I) in a large representative sample of children/adolescents in a broad age range. Study II is an attempt in developmental psychopathology research to carry out a cross-cultural comparison, using the same instrument for 2 and 3 year old children in two countries.

Unfortunately it was not possible to do a follow-up reliability study with diagnostic interviews on the normal population children in Study I, as was planned in the beginning, because of lack of permission from the Icelandic Data Protection Commission. In spite of these shortcomings the data in these studies (I-IV) formed the basis for tentative conclusions regarding clinical and non-clinical characteristics (I-II) of children and adolescents through multi dimensional evaluation in the clinical setting (III-IV).

The patients in Study III and IV are considered reasonably representative of child and adolescent psychiatric out- and inpatients in Iceland. In Study III the subjects were all patients in child psychiatric outpatient clinic and the study is a retrospective one. In Study IV the adolescents are from inpatient hospital for alcoholic and narcotic problems, all consecutive admissions to inpatient treatment during the study period. The exclusion of patients admitted for long-term treatment may tend to bias the results of the studies. However, it is unlikely that this has any major influence on the results, because of the limited number of long term treatment children in Iceland. Because the patient material in Studies III and IV is from two hospital facilities it gives the studies more power to generalize from the findings.

9.1.3. Methods

One of the major strengths of the present studies was the use of validated behaviour questionnaires, in a large general population sample. In Iceland there has previously been a lack of standardized measures to evaluate children and adolescents in the general population, in child psychiatry settings, during assessment, and especially their treatment at discharge from hospital settings. In studies III and IV no behaviour ratings were obtained at the follow-up after their

hospital stay nor on outpatient discharge. Often child psychiatric conditions do not fall into clear-cut diagnostic categories. The use of quantitative instruments may therefore aid in describing emotional and behavioural problems that occur together in child psychiatric conditions.

One of the main limitation of Study I is the lack of the two-stage design, and the evaluation of the external validity of the CBCL based on a general population sample, and the use of an independent clinical, but empirically validated criterion of caseness.

Socio-economic status (SES) was scored according to the Hollingshead scale (1975) of occupation, as reported by the parent (Study I). If both parents were employed, the higher-status occupation was used to score SES. In Study II the data on socio-economic status was unfortunately not collected in the same way in both countries, and could not therefore be analysed. The diagnoses in Study III, IV were based on the author's clinical experience and judgement, and past history (anamnesis) of the subjects. The same clinician (the author) with her coworkers performed all ratings of the instruments and the clinical diagnoses, for the treated population. The diagnostic procedures used for out- and inpatients are based on the clinical ICD-8/9/10 and DSM-III / IV diagnoses. A reliability study to support the diagnostic procedures was not conducted, as was explained earlier. The results in Study III match closely results obtained in similar clinical studies using the ICD-9/10 and DSM-III / IV diagnoses, namely that girls are more likely to experience emotional problems and boys behavioural disorders (Davison et al. 1994, Rutter et al. 1988; Isager,1976).

The results suggest that the measurements used, are a reliable assessment method for screening child and adolescent psychiatric in- and outpatients. Altogether, the community studies and the clinical studies provide a relatively solid basis for certain conclusions in child and adolescent psychiatry in Iceland, among the general population and in clinical settings. According to Angoff (1988), all properly collected data can be regarded as validity data.

9.2. Emotional and behavioural problems of school age children

The Study I's data on the behaviour/emotional problem score in 943 Icelandic children aged 4-16 from the general population is 17.5 (boys 19.1; girls 15.8). This is quite similar to other

studies (Crijnen et al. 1997;1999). The effect of demographic variables on CBCL item scores is small, which is in agreement with findings reported in a number of international studies (Verhulst et al. 1995). Thus the findings contribute to earlier findings of CBCL studies in other cultures. There is no direct information on the prevalence of psychiatric disorder in Study I, only on the mean total behaviour problem scores, and mean total competence scores.

The age effects on individual problem items, were larger in size and number than the gender effects, which is in agreement with the findings of other studies (Verhulst et al.1985a). A number of items decline with age, indicating a connection to maturation. Numerous gender differences have been demonstrated in individual item scores in other studies (Verhulst & Achenbach,1995). In Study I the main gender differences in individual item scores were between boys and girls at age 4-11, boys showing at that age higher externalizing and internalizing scores than girls. *Aggressive behaviour syndrome scores* were reported more frequently in young boys than young girls. Girls shift to higher internalizing scores at 12-16 years of age, but show low scores on aggressive behaviour syndrome scores at that age.

Achenbach (1991) reports higher internalizing scores for girls between 12-18 years of age, but lower internalizing scores for boys aged 4-11 years, than in his study. *Delinquent behaviour syndrome scores* is higher among boys between age 4-11 and for girls aged 11-16 years.

Achenbach (1991) reports lower scores for delinquent behaviour in both sexes at these ages. *Anxiety/depressive syndrome scores* are more common among boys between 12-16 years than among girls. Achenbach (1991) has lower scores for anxiety and depression for both genders at this age. Boys score higher on the *somatic complaints scale* between 4-11 years than do girls.

Social problems scale scores were more common among girls between 12-16 years old than for boys of the same age. *Thought problems syndrome scores* were more common among girls than boys at all ages. Girls had higher scoring than boys on the *attention problems scale*.

Aggressive behaviour and anxiety /depressive syndrome scores were reported more frequently for both genders of all ages than any other syndrome scores among the behavioural and emotional problems scores. Whether this finding represents cultural differences in the judgement of behaviour or problem levels among parents of children in Iceland, or is a result of sampling differences may be further explored, in future studies. It is possible that a bias was introduced in the analysis in the comparison between the ages and genders because of some variation in the number of children and adolescents between some of the age groups.

Comparisons with other Scandinavian studies show the total mean problem score to be the lowest in Sweden, or 14.2 (Larsson & Frisk, 1999). In Norway in two studies conducted from various parts, the total mean problem score was 15.4 (Növik, 1999), and in a study on 13-16 year old boys and girls by Kvernmo & Heyerdal, (1998), the total mean problem scores were 17.2 for boys and 14.3 for girls. In a recent study in Denmark, the total mean problem score is 17.7 (Bielenberg & Hörder, 1998), which is very similar to the Icelandic score of 17.5 (I). In a small scale study in Finland, the total mean problem scores were 16-19 (Almqvist et al. 1988), which is rather similar.

When the outcome of these Scandinavian studies is compared to other CBCL's epidemiological studies, they suggest that the parents of school-aged children and adolescents, report similar emotional and behavioural problems as parents elsewhere, but generally at lower levels compared with parents in several other countries. A possible explanation is that Nordic parents have a higher tolerance for deviant emotions and behaviours among, their children and themselves than parents of other cultures, or are more denying of their childrens problems than elsewhere in the world. Or is environmental support and preschool education for children and parents so much greater in the Nordic countries compared to other countries as to affect, and decrease childrens's problem behaviour?

Detailed CBCL epidemiological data have been reported from Canada (Ontario), Chile, China, Singapore, Thailand, Holland, France, U.S.A, Germany, Australia, Belgium, Greece, Israel, Jamaica, Sweden, Finland, Norway, Denmark and France (Crijnen et al.1999).

Age and gender variations among syndromes scored from parents' ratings were quite similar across the above cultures. In Study I, sample sizes and mean total problem scores are shown from seven countries for 6-11 year old children. The differences in all seven countries were remarkably consistent in that girls obtained a mean score slightly below that for boys. In the U.S.A., Holland, Germany, Denmark and Iceland, there is a striking similarity in the mean total problem score in these age groups.

9.2.1. Emotional and behavioural problems of preschool children

The level of emotional and behavioural problems in Icelandic pre-school children for the general population of children turned out to be 27.5 (boys = 29.2; girls = 25.6) (Study I). The

corresponding figure in Finnish general population pre-school children turned out to be 26.5 (boys = 27.4; girls = 25.6), and for such Icelandic pre-school children 27.0 (boys = 28.7; girls = 25.2) (Study II).

The mean total problem score for Dutch preschoolers (N:273) in a study of a general population was 33.4 (Koot & Verhulst 1991). The mean total problem score of American pre-schoolers was 40.6 (Achenbach et al.1987b) and in Montreal, Canada, for 756 children age 3 years, 32.9 (Schwager et al., 1982).

The mean total behaviour problems score for the 2-3 year olds was slightly higher among 3 year old boys than girls. The difference was not statistically significant (Study I).

In Study II, boys in both countries were rated as having more externalizing behaviour problems and more destructivity and aggressiveness than girls. This is consistent with the converging evidence in school-age children that indicates higher rates of externalizing symptoms in boys than girls (Achenbach et al. 1991). The only statistically significant cross-cultural difference in Study II between the CBCL scales, was found in the anxious-depressive syndrome scale, on which the Icelandic children obtained slightly higher scores. However, the one-point difference between Icelandic and Finnish children on the anxious-depressive syndrome scale is clinically rather marginal. The mean problem score for Finnish and Icelandic pre-schoolers is lower than the mean problem score found for the American (Achenbach et al.1987b), Canadian (Schwager et al.,1982) and Dutch pre-school children (Koot & Verhulst, 1991).

The specific items data was rather similar in all the countries. There seemed not to be any coherent pattern in the symptoms scores. The conflicting data across studies in documenting higher externalizing scores in boys as compared to girls may be a matter of measurement, cultural or a “biological difference” or it may reflect differences in the parental expectations of boys and girls. Because of differences in the administration of the questionnaire in the two countries, there is a possible sampling bias. Therefore the data available restricts the interpretation of the findings. However, the present study provides further support for the CBCL 2-3 being used in research interculturally and internationally, because the similarities in the results are more striking than the differences between the countries.

9.2.2. Use of Child Behaviour Checklist in Iceland. Cutoff point.

Each scale in the CBCL has cutoff points for distinguishing between the normal and clinical range or clinical purposes. It is important to distinguish between children who are in the normal versus the clinical range, according to the cutpoints. Achenbach identified a borderline clinical range for each scale, because categorical distinctions are usually least reliable for individuals who score close to the border of a category.

The optimal cutoff point shown in Table I (p.32) is found with ROC analysis as detailed by Fombonne (1991), which is a similar procedure to Achenbach's cutoff point.

The false positive for girls in the age group 4-11 is 11% but for boys in the same age group 17%, which means that 11% of healthy girls (TN=89%) and 17% of healthy boys are within the clinical range of the list. The false negative is 26%, and 74% (true positive), are in the clinical range of those having emotional and behavioural problems. These are the estimated approximate population figures from Iceland. The raw score and the T score were used to select the cutoff point such that the FP value is approximately 10%. Populations were grouped for both sexes in age ranges 4-11 and 12-16. When the number of children is smaller in each age/gender group the uncertainty increases, and the cutoff point will be less accurate. The number of treated children was only n=329 and there were fewer children in the older age-groups compared to Achenbach's and Verhulst's studies (1981,1985).

A similar division by age and gender was employed by Achenbach et al. (1981) and Verhulst et al. (1985).

Achenbach's cutoff selections (1991) gave 82% of the referred sample and 30% of the nonreferred sample in the clinical range. The borderline "category" often yields stronger associations between clinical status and classification of children according to their scale scores. It is seldom warranted to make a definitive clinical versus nonclinical judgement on the basis of any single procedure, but it is prudent to allow a borderline clinical range.

Richman et al. (1982) in their survey of behaviour problems in 3-year old children found 25% false negatives and 13.1% false positives.

Another approach to determine the cutoff point, above which mental disorder is supposed to be present is to compare the questionnaire's total score with psychiatric judgment. Rutter et al. (1981) compared psychiatrists' overall impairment ratings, based on information obtained through parental interviews, direct physical assessment of the child, and on teachers' reports, with children's total scores on both parent and teacher questionnaires. Psychiatrists gave each child a clinical rating of disturbance, based on all information about the child's behaviour gathered by the interviewer, who gave the questionnaire to the mother during a home interview. Following this method they found a total misclassification rate of only 8.6%.

Compared to the multivariate statistical techniques, a simpler statistical approach to weigh scores is the one used by Kastrup (1976). The author arbitrarily decided that any behaviour that occurred in fewer than 10% of the children, was to be considered as deviant. Each child received a total deviance score by summing the scores for each item recorded on the questionnaire, which was deviant on the basis of the 10% criterion or 90th percentile.

In order to select the critical score or cutoff point at which the best prediction can be made about the child's referral status, the first way is the investigation of the cumulative frequencies of the total behaviour problem scores, and total social competence scores. The second method to discriminate between referred and the general population children is done by discriminant function analysis. Instead of presenting the data for every age and gender, the populations were grouped for both sexes in age/gender ranges, like Achenbach et al. (1981) and Verhulst (1985) did. The misclassification rates at cutoff points corresponding to approximately the 90th percentile for the general population children, is similar to Achenbach's and Verhulst's results.

9.2.3. Characteristics of outpatients

In Study III, there was an increase between the two patient groups between the years (1973-1976 and 1987-1988) in the number of children that received the diagnoses of emotional and conduct disturbances, and specific delays in development and a decrease in the number of children receiving the diagnoses adjustment reactions during the latter period. This is not explained by the change in male to female ratio, as these diagnoses are about equally frequent among boys and girls in this population. The diagnostic practice may be explained by the change in the unit from 1973, when ICD-8 was used, until 1989, when ICD-9 came into being, and later DSM-III

made an effect on the diagnostic work. To some extent these changes may be understood as reflecting changes in the Icelandic society and its health services. The prevalence of other disorders did not change, including family disruption, chromosome anomalies, mental retardation, migraine, epilepsy, and alcohol or drug abuse. Social changes in the health services in Iceland are to some extent reflected in the changes observed in the patient population, and in diagnoses in this study. The increase in mean age of about 1 year in the patient population at the clinic is likely to be partly related to the establishment of the adolescent psychiatric unit in 1987, and connected to the extended outpatient service of the unit. Only 14.6% of children from the outpatient department were admitted to inpatient wards (III). The low service utilization rate in child and adolescent psychiatry in Iceland, or 0.2% (III), points towards greater clinical needs that were not met, when prevalence rates from epidemiological studies were compared to service utilization rates.

It is therefore assumed that only a minority of children and adolescents with psychological and psychiatric disorders in Iceland are seen for assessment and treatment.

Approximately 30% of the patients received more than one diagnosis, and 5% of them more than three diagnoses. The most frequent second diagnoses were "specific delays in development" and "disturbance of conduct".

There are a variety of factors that can contribute to high rates of comorbidity (Achenbach et al., 1990/1991). Rates of co-occurrence of child psychiatric disorders have been reported repeatedly in epidemiological studies of children in the general population. For instance over two-thirds (68.2%) of the children aged 6-16 with a diagnosis of at least one of the four psychiatric disorders had one or more additional diagnoses (Offord, Boyle & Fleming, 1989).

9.2.4. Psychosocial functioning and comorbidity of adolescents with alcohol and narcotic problems.

Study IV found a statistically significant difference between the treated and the general population of adolescents, a 2.5 times higher mean total behaviour problem score for the treated hospitalised adolescents. In the treated group there was no statistical significant difference in age, sex and age*sex interaction. *Delinquent /aggressive* behaviour and *anxiety /depressive syndrome scores* were reported more frequently for both genders at all ages than any other syndrome scores, among the behavioural and emotional problems scores of the YSR. The

general population group had higher total social competence scores, which was statistically significant.

No statistically significant difference was found in the social status of the parents of the treated adolescents, compared to the general population adolescents. The high prevalence of comorbid psychiatric disorders and the high number of psychiatric diagnoses, has shown that many adolescents seeking substance abuse treatment are multi-problem patients who need to be correctly assessed, diagnosed and treated. Mid adolescence is the peak age for the onset of abuse or dependence (Milin et al.1991; Aðalbjarnardóttir et al. 1997 & Thórlindsson et al.1998). Many other psychiatric diseases have the same age onset, such as Major Depressive Disorder, Bipolar Disorder, and Phobic Disorder. This complicates any analysis of comorbidity, and the relationship between substance abuse and other psychiatric illnesses.

No significant difference was found related to sex, age or the combined sex*age effect on 2-Way Interactions in the treated or in the general population group (Study IV). The findings concerning differences between treated and normal population adolescents should be regarded as preliminary, due to the rather small size (N=103) of the Icelandic treated sample.

A comparison of the total problem scores in North American and Dutch referred samples of adolescents revealed smaller differences. North American referred boys had a mean total problem score of 55.5, versus 52.5 for Dutch referred boys. North American referred girls had a mean total problem score of 64.1, versus 59.0 for the Dutch referred girls (Verhulst et al.1989). These studies did not solely focus on substance abusing adolescents but more general treated adolescents.

The mean total problem score for North American males (normal population) was 39.0 and for North American females 44.0 (a random sample of 807 adolescents aged 11-18), (Achenbach, 1991), whereas the mean total problem score for Dutch males (normal population) was 26.0 and for Dutch females 28.6, of a total of 941 adolescents (Verhulst et al.1989). However, it is not possible to make any rigorous cross-cultural comparisons between these abovementioned studies because the samples size varies and difference in methodology exists.

9.3 Clinical Implications

An important implication in research in the field of developmental psychopathology, is always to control for age, gender and SES effects. This is of major importance when planning adequate mental health service systems for children and adolescents in every country. Parents in Iceland responded in similar ways to the problem items of the CBCL, as did the parents in U.S.A., Denmark, Finland and The Netherlands. Yet the clinical cutoff point is not entirely the same as in the U.S.A. and The Netherlands, which is most likely because of the difference in the sample size of the referred children between the countries. Crijnen et al.(1997) state that it should not be assumed that the same clinical cutoff point be equally for all cultural groups.

The three screening instruments used in this study, add to those obtained earlier with the CBCL and YSR across cultures, and make clearer the picture of the status of mental health among children and adolescents in Iceland.

The introduction of patients into research in child and adolescent psychiatry through screening of child psychiatric disorders, is of high priority in every country, because the effect of psychiatric disorder on the course of normal childhood, and adolescent development, is an important factor in adult life. It is particularly important to identify the groups that are at high risk for disorder and to find ways of reducing that risk to ensure that the needs of high risk groups are met at any time. Through epidemiological research in child psychiatry, it is possible to provide information on the need for psychiatric care among children, and on the need for services. Only a small minority of children with emotional and behavioural disturbances are now being helped by mental health and social services in Iceland, which is not at all specific for Iceland, but is in fact generally true for many other countries.

Other sources of help in Iceland are consultations with family physicians, pediatricians, psychologists and social workers within the educational system, nurses and teachers at schools, child psychiatrists and psychologists working privately or in institutions, and various self-help groups in the community. Self-help groups have become active in the field of substance abuse and sexual abuse in the past decade.

9.4. Perspectives on the development of child and adolescent mental health services and teaching in Iceland

Children and adolescents with mental disorders are today diagnosed with ICD-10 (or the equivalent DSM-IV) which highlights the need for broad clinical experience in the field of child and adolescent psychiatry, and familiarity with the developmental changes taking place in childhood, in order to ensure reliable diagnostic assessments and treatment.

Child and adolescent psychiatry must utilize its knowledge of the etiology of mental disorders, to promote the health of children, and to strengthen the capacity of families and communities so as to reduce the incidence and prevalence of substance abuse, which is a serious problem in Iceland among adolescents.

In community studies, like these, the whole spectrum of disorders is covered, including those individuals who do not receive or seek treatment. However, the cross-sectional nature of the studies did not permit inference as to which course the behaviour of an individual, child/adolescent may follow. Hopefully, future studies will achieve that.

According to a previous study in Iceland, only 2.3% of children received service from various consultants in Iceland (Hannesdóttir & Hansen, 1982). A review of the availability of national data from several countries, shows that approximately one to two per cent of children are receiving mental health services in mental health settings (Burns & Friedman, 1990), whereas some 6% of these services related to mental health are located within the primary care, and school systems (Costello, 1986, 1989). Most services available are concentrated at the level of tertiary prevention, that is, caring for those with diagnosed treated disorders, and trying to prevent relapse and deterioration. Service availability, even for tertiary prevention, in Iceland, is far lower than the need.

The Government has not yet decided upon a national policy on mental health for children and adolescents, and as to what has caused difficulties in the administration of child and adolescent psychiatry in Iceland for many years, with consequent lack of ambition in academic medicine, and lack of independence of the discipline and autonomy of the service given, in spite of the international independence of the speciality in medicine since 1993 in Europe. Hopefully in the near future more interdisciplinary co-operation in research between the pediatric/medical disciplines and the psychological/social and behavioural sciences, will appear.

The future goals are first and foremost to put more pressure on the Government and the University of Iceland in order to gain a full independent chair in child and adolescent psychiatry at the Medical School to integrate teaching, training and clinical work, and to continue with research work in the speciality especially in the field of epidemiology, neuropathology, and genetics, with developmental perspectives in mind. More co-ordinated community research work is needed among all specialities taking care of children and adolescents, through improved laws and legislation, and by breaking down the walls between the ministries and the professional people, to integrate research, and for the service to increase the prevention of mental health disorders. There is a considerable shortage of mental health services for the guidance of children and parents in Iceland, which in other countries is connected to outpatient services in the communities, pediatric departments, and primary care physicians, or social services.

The main future goals cover five different areas, all aiming at a better research and treatment for children: 1) To improve quality in the diagnostic and clinical daily work for children and professionals through clinical research; 2) to develop methods for measuring quality in treatment and care through research; 3) to improve education for students, staff and specialists; 4) to promote basic and clinical research in development and genetics; and 5) to integrate treatment and to encourage more interdisciplinary work in research.

10. SUMMARY AND CONCLUSIONS

Objectives: First, to provide data and to test the applicability of a standardized rating scale for assessing Icelandic children's behavioural/emotional problems and competencies, and to identify differences related to demographic variables. Second, to compare the behaviour problems of 2-3 year old children in Finland and Iceland with the CBCL/2-3. Third, a comparison is made between patients seen in the outpatient clinic of the child and adolescent psychiatric unit of the University Hospital of Iceland during the 4-year period 1973-1976, and patients seen during the 2-year period 1987-1988. And fourth, to evaluate psychosocial functioning and psychiatric comorbidity of the treated adolescents with alcoholic and narcotic abuse.

Methods: The Child Behaviour Checklist (CBCL) and the Youth Self Report (YSR) by Achenbach are used to estimate the reported level by parents of emotional and behaviour problems in children from 2-16 years of age, and adolescents aged 11-18 from the general population. The CBCL/2-3 were completed by 109 parents of 2-3 year old children; 943 parents of 4-16 year old children, and the YSR by 545 adolescents from the general population. CBCL/2-3 was completed by parents of 493 preschoolers from Iceland and Finland. The subjects from the outpatient clinic during the 4-year period were 702 and for the 2-year period 311. Diagnoses were made in accordance with ICD-8 in the 4-year period, but in the 2-year period with ICD-9. All the records from both periods were reviewed by the author. Of the inpatients with alcohol and narcotic abuse, 103 completed the Youth Self Report at the end of a ten-day inpatient stay.

Results: CBCL results are presented for 2193 children/adolescents and additional data on 1013 child and adolescent psychiatric outpatients. Comparisons with other countries suggest that there are limited differences in the prevalence of psychopathology as measured by the CBCL. Behaviour problem scores for Finnish and Icelandic children were rather similar. Mean behaviour problem scores for the treated population were significantly higher for males and females of all ages compared to the general population. Comorbidity in adolescents with substance abuse disorder was found to be common, the most frequent diagnoses were conduct disorder (36%), depression (22.6%) and post traumatic stress disorder (9.3%). Results from the psychiatric outpatient clinic show an increase in the mean age of the patients seen in the clinic,

and a decrease in the male to female ratio. There is an increase in the relative number of patients with diagnoses of disturbance of conduct, disturbance of emotions, and specific delays in development, but a decrease in the number of diagnoses of adjustment reaction.

Conclusions: No significant differences were found between Finland and Iceland in regard to emotional and behavioural problems of preschool age children. Upper-SES parents reported fewer problems than lower-SES parents, both among children and adolescents. Aggressive behaviour and anxiety / depressive syndrome scores were reported more frequently for both genders at all ages than any other syndrome scores among the behavioural and emotional problems scores. The service utilization rate is very low in child and adolescent psychiatry in Iceland, only 0.2% of the total population in the age group 0-19 years old. Comorbidity among adolescents with substance abuse disorder is high, and important to evaluate, diagnose and treat, during and after withdrawal treatment.

Key words: Epidemiology, screening, parent/adolescent reports, child/adolescent psychopathology, Child Behaviour Checklist, Youth Self Report, substance abuse, inpatients/outpatients, comorbidity.

Correspondence: Helga Hannesdóttir M.D. Department of Psychiatry, Landspítali, University Hospital, Fossvogur, Reykjavík, Iceland. Tel. 354-525-1000. Fax: 354-525-1402. Email: helhann@landspitali.is

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13. THE ISLANDIC TRANSLATION OF THE CBCL 2-3, CBCL 4-18 AND THE YSR

14. APPENDIX 1 – 2

Items Graphs of CBCL and YSR.

16.1. Figures 1-112. Percentage of children in the general population sample (N=943) of each gender for whom each emotional/behaviour problem was reported by the parents. Scores of 1 and 2 for each item are combined to obtain the percentage for whom the problem was reported. -
---- Girls ___Boys

16.2. Figures 1-111. Percentage of adolescents in the general population sample (N=545) of each gender for whom each emotional/behaviour problem was reported by the parents. Scores of 1 and 2 for each item are combined to obtain the percentage for whom the problem was reported. ----- Girls ___Boys

15. ERRATA

In **paper I**, there is a printing mistake on p.242 in Table 6, for 5 year old boys the mean is **17.3** but not 1.73.

16. PAPERS I-IV ORIGINAL COMMUNICATIONS