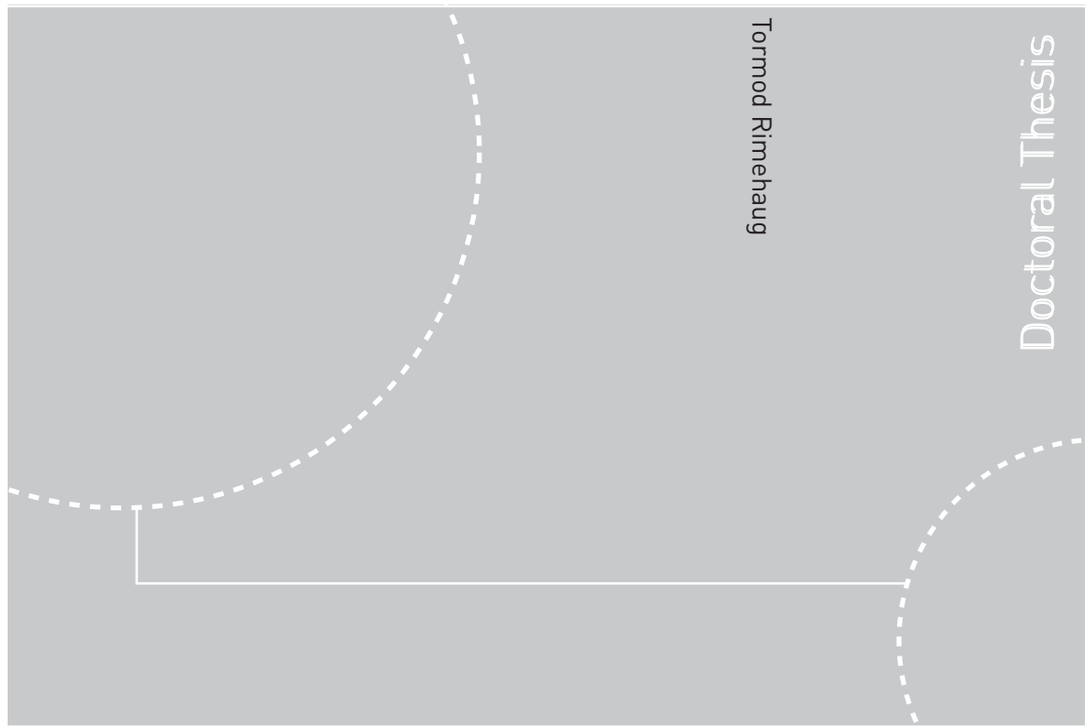

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Følelsemessig belastning og foreldrefungering blant foreldre i befolkningen og foreldre med barn henvist til psykiatrisk behandling

Hovedtemaet for denne avhandlingen er hvordan det er å være foreldre, generelt og når barn behandles for psykiske problemer. Foreldrefungering ble konkretisert som dimensjonene varm, beskyttende og autoritær foreldrefungering. Angst- og depresjons-symptomer ble brukt som tegn på følelsesmessig belastning. Fordeling, stabilitet og endring i følelsesmessig belastning og de tre foreldre-dimensjone ble studert i befolkningen generelt og blant foreldre før og etter familieorientert behandling av barn med langvarige psykiske helseproblemer.

Befolkningstudien HUNT2, foreldre i en mindre befolkningsundersøkelse og foreldre tatt inn ved BUP familieavdelinger i Trøndelag og på Vestlandet bidro til i undersøkelsene.

Foreldre mellom 30 og 50 år i HUNT2-undersøkelsen (N = 24.040) viste liten forskjell i angst og depresjon sammenlignet med ikke-foreldre. Risikoen for angst var knyttet til å leve alene eller å være tidligere skilt, og risikoen for depresjon var bare knyttet til å leve alene. Årsaksretningen i disse sammenhengene bør undersøkes nærmere fordi psykisk helse kan ha stor innflytelse på både parforhold og foreldreskap.

Gifte foreldre og tidligere ugifte samboende foreldre har best psykisk helse i den norske befolkningen. Å være samboende eller enslige foreldre innbærer en mindre risiko for psykisk helse i Norge enn undersøkelser fra USA tyder på. Forskjellene kan skyldes bedre familiepolitikk, levekår og holdninger i forhold til samboerskap og enslige forsørgere i Norge.

I løpet av ni måneder viste foreldre i befolkningen (N = 150) høy stabilitet i varm foreldrefungering. Ustabilitet i varm omsorg var knyttet til lav varme, foreldrenes personlighetstrekk og lav opplevd varme i egen oppvekst. Ustabil varme forekom bare hos en mindre gruppe foreldre. Beskyttende foreldrefungering var moderat stabil, og ustabilitet var knyttet til å være overbeskyttende. Autoritær foreldrefungering forandret seg svært mye i løpet av ni måneder, bare en 1/3 rapporterte samme nivå av autoritær fungering. Ustabil foreldrefungering er bekymringsfull for barn, men har vært forsket for lite på.

Mange foreldre i henviste familier rapporterte mindre varme overfor barnet enn hva som er vanlig. Etter barnepsykiatrisk familieinnleggelse (N = 102) var foreldrenes varme overfor barna forbedret, og holdt seg bedre også ett år etter, unntatt for foreldre til barn med atferdsvansker. Foreldre til barn med emosjonelle vansker hadde ikke lavere varme i forhold til barna enn foreldre i befolkningen på noe tidspunkt.

Mødrenes angst og depresjon var oppsiktsvekkende høy ved henvisning til BUP Familieavdelinger, men bedret seg betydelig etter innleggelsen og var fortsatt bedre ett år etter. Redusert angst hos foreldrene hang sammen med generell symptombedring hos barna.

Kandidat Ph.D. i klinisk medisin: Tormod Rimehaug
Tilknytning og finansiering: Regionsenter for barn og unges psykiske helse i Midt-Norge
Veileder: Turid Suzanne Berg-Nielsen og Jan Wallander

Ovennevnte avhandling er funnet verdig til å forsvares offentlig for graden ph.d. i klinisk medisin. Disputasen finner sted i Auditoriet, Medisinsk-teknisk forskningssenter, Trondheim Fredag 9.mars 2012. Prøveforelesning kl.10.15. Disputaskl.12.15

Henry Moore: “Maquette for Family Group”, 1945

CONTENT

ATTACHED PAPERS

- STUDY I
- STUDY II
- STUDY III

APPENDIX

1. Hospital and anxiety and depression Scale (HADS), Norwegian version
2. Parental Bonding instrument, current parent self-report (PBI-PCh), Norwegian version
3. Parental Bonding instrument, adult offspring report (PBI-M/F), Norwegian version

DISSERTATIONS AT THE FACULTY OF MEDICINE, NTNU

PREFACE

The root of this thesis was my clinical experience with children, adolescents and their parents in community services and child and adolescent mental health services. Some parents pose an obvious risk to their children's mental health, and in some cases, they are even the primary cause of their children's troubles. However, most parents try their best to support, care for and help their troubled child. Often, their efforts are sustained for years before reaching adequate professional services, resulting in feelings of worry, helplessness and bewilderment. Parents want the best for their children, and their parenting role is important and precious to them, even among those who have been neglecting or hurting their children.

In respect, I therefore dedicate this thesis to its subjects:
Mothers and father, especially those who have children with mental health problems.

1. ACKNOWLEDGEMENTS

I will first thank the parents, children and adolescents I have met during my clinical work and research. I am also proud to thank my children and stepchildren for all they have taught me about the importance and challenges of parenting.

This thesis would not have been completed without the generous support and encouragement of my employer, the Regional Center of Child and Adolescent Mental Health at the Norwegian University of Science and Technology in Trondheim, and the Medical Faculty. I am also in great debt to fellow clinicians in Bergen, Levanger, Namsos and Trondheim for recruiting families and collecting data in family inpatient clinics in child psychiatry and to teacher and parent representatives for recruiting parents and administering questionnaires in their school classes. Thanks also to the HUNT Research Centre for allowing me access to the data on parents and non-parents in the Nord-Trøndelag Health Study, HUNT2.

Above all others, I thank my primary supervisor Turid Suzanne Berg-Nielsen for offering important initial inspiration and help in my original choice of parenting and parents as my focus of research, for sharing data with me and playing a crucial part in guiding the completion of this thesis. I am deeply grateful to my secondary supervisor Professor Jan Wallander for supervising my scientific writing with friendly and encouraging patience. Special thanks also to Professor Bo Larsson for important help with paper drafts and to my original supervisor, Professor Graham Clifford, for letting me develop my own ideas freely.

Last, but before others in importance, this thesis would not have been possible without the generosity of and stimulating discussions with my dear and patient wife Ingunn.

2. LIST OF PAPERS

I. Rimehaug, T., and Wallander, J. (2010). Anxiety and depressive symptoms related to parenthood in a large Norwegian community sample: the HUNT2 study. *Social Psychiatry and Psychiatric Epidemiology, 45*(7), 713-721.

II. Rimehaug, T., Wallander, J., and Berg-Nielsen, T. S. (2011). Group and individual stability of three parenting dimensions. *Child Adolesc Psychiatry Ment Health, 5*(1), 19. Retrieved from http://www.capmh.com/content/5/1/19. doi:1753-2000-5-19

III. Rimehaug, T., Berg-Nielsen, T. S., and Wallander, J. (2011). Change in self-reported emotional distress and parenting among parents referred to inpatient child psychiatric family treatment. *Nordic Journal of Psychiatry; Early Online*, 8pp. Retrieved from http://informahealthcare.com/doi/abs/10.3109/08039488.2011.630752. doi:10.3109/08039488.2011.630752

3. ACRONYMS AND ABBREVIATIONS

ADHD	Attention-Deficit Hyperactivity Disorder
ANOVA	Analysis of variance
GLM	General Linear Modeling
HADS	Hospital Anxiety and Depression Scales
HUNT	The Nord-Trondelag Health Study (Helseundersøkelsen i Nord-Trøndelag)
NEO PI-R(sv)	Revised Neuroticism Extraversion and Openness Personality Inventory – Norwegian short version
PBI	Parental Bonding Instrument
PBI-M/F	Parental Bonding Instrument Mother/Father version (retrospective childhood parenting)
PBI-PCh	Parental Bonding Instrument - Parent-Child version (current parenting)
SEM	Structural Equation Modeling

4. DEFINITIONS AND DELIMITATION

Parenting and parenthood. *Parenting* is defined here as the behavioral and relationship aspects of providing primary care for children and adolescents. Parenthood relates to being a parent or not. In this thesis the focus is on parenthood in social terms. *Social parents* are defined as occupying the psychological and social role as parent and thus performing acts of parenting and developing a parent-child relationship. Neither biological parenthood, nor legal or economic parental responsibility is necessary or sufficient for social parenthood. Professional care-taking is not included unless it replaces all the daily functions of a parent.

Parent. In accordance with the definition of parenting and parenthood given above, the parent concept includes step-parents, adoptive parents and foster parents in addition to biological parents with custody. Non-custodial biological parents are included if their contact with and part-time care of the child is considerable. Grandparents and other relatives are included if they replace parents in manner similar to foster parents. Non-resident partners who only provide supplemental parenting are not included. Empty-nest parents are not included because the behavioral aspect of their parenting has ended.

Child or offspring. 'Child' is used as a short term for children and/or adolescents, in this thesis concentrated on those approximately 8-18 years old. However, *offspring* is used to denote offspring regardless of age or specie. Thus, offspring can be adults e.g. retrospectively reporting on parenting during childhood, or children reporting on current parenting.

Retrospective childhood and current parenting. *Current parenting* refers to parenting in a current parent-child relationship. *Retrospective childhood parenting* refers to parenting during a previous childhood reported cumulatively in retrospect.

Clinic and community parents. *Clinic parents* are used to denote parents of children referred to child psychiatry services (*clinics*). These parents do not represent a clinical population but are encountered in clinical service setting. *Community parents* refers to parents representing the general population, recruited from the community or through community services like public school. They are not by definition healthy persons since some prevalence of disorders and mental health problems will be present representing population base rates.

Child psychiatric services and specialized services, child mental health services and community services. "Child psychiatry" or "specialized services" are used here to refer to outpatient or inpatient services for child- and adolescent mental health in hospital organizations. In Norway these are services only available through referrals from community services or other specialized services. Community services are services organized by municipalities/cities that accept direct requests from parents and children. *Family clinics* are use here to denote inpatient family units in child psychiatry.

Psychiatric disorders, developmental disabilities and mental health problems. Psychiatric disorders refer to ICD-10 diagnoses in the range of F10-69 through F90-98 whereas learning and developmental disorders are found in the ICD-10 diagnoses F70 through F89, as evaluated by qualified clinicians or researchers. Mental health problems refer to symptoms merely indicating psychiatric disorders as experienced and reported by non-professionals often using questionnaires.

Emotional distress, anxiety and depression. *Anxiety and depression* are used here as signs of *emotional distress* or indicators of mental health problems and do not imply the presence of an anxiety or depressive disorder. Anxiety and depression are well suited are non-specific symptoms in many mental health problems and psychiatric disorders. *Clinical levels* of anxiety or depression refers to symptoms that exceed a defined limit of potentially clinical importance but does not imply a diagnosed disorder.

5. SYNOPSIS – ENGLISH

Background: The purpose of this thesis was to investigate the distribution of and the change in parental emotional distress and parenting dimensions by combining samples of *community parents,* non-parents and *clinic parents*. Clinic parents were involved in intensive inpatient family treatment related to their children's psychiatric problems.

Research questions: The focal themes of the three research questions were as follows:

1) Anxiety and depression among community parent and non-parent subgroups,

2) The stability of parenting dimensions among community parents

3) Longitudinal changes in parents related to family inpatient treatment in child psychiatry.

Anxiety and depression among community parents. Overall, parenthood itself did not seem to have a primary influence on anxiety and depression in the population. In a large community health study (HUNT2) parents displayed only slightly less anxiety than non-parents, however, previous divorce and single status were found to be the risk factors for current anxiety, whereas single status was a risk factor for current depression. In the analyses, social class, education, gender and age were controlled for. Married and previously unmarried cohabiters represented the base level regarding anxiety and depression. The differences between these current results from Norway and results of previous research from the United States may be explained by the better economic conditions for families, more liberal attitudes regarding cohabitation and single parents and generous parental leave, child-care and supportive family policies.

Parenting Stability: Parenting warmth was highly stable across the nine-month evaluation period, although it was not as stable as personality traits were. However, most of the observed instability in warmth originated from a small group of parents and was associated with low warmth, personality traits and experience with low maternal warmth in

the parents' own childhood. Stable low warmth was a rare occurrence. Parenting protectiveness was moderately stable, and its instability was associated with high protectiveness scores. Parenting authoritarianism was the most unstable; only one-third of parents reported the same level of authoritarianism when asked again after nine months.

Longitudinal follow-up of parents in child psychiatry family inpatient clinics. Parents of children with attention, learning and developmental disorders reported significantly higher parenting warmth scores 3-month and 12-month follow-ups after treatment, compared to scores at the start of treatment, but it still remained lower than among community parents. However, normal levels of parenting warmth were reported at all points by parents of children with emotional problems, whereas no improvement was observed in parents of children with behavioral problems. Maternal anxiety and depression also improved significantly at 3-month and 12-month after treatment, yet anxiety and depression remained higher among family clinic mothers than among community mothers. Improvements in anxiety and depression were not related to child diagnostic categories. However, a reduction in parental anxiety was related to a general reduction in children's symptoms, whereas a reduction in parental depression was related to improved parenting warmth.

6. INTRODUCTIONS

6.1. General introduction

6.1.1. Topic

The primary focus of this thesis is parenting dimensions and parental mental health in the community and among parents of children in child psychiatry services. Distribution and change have been chosen as study topics within this theme.

The distributions of anxiety and depression in community subpopulations of parents and non-parents together with stability and distributions of parenting dimensions among community parents are addressed in the first two papers of this thesis. These community data represent basic reference materials for the next paper of the thesis that investigates the mental health and parenting of parents of children treated for mental health problems, both before admission and after treatment in child psychiatric family clinics.

6.1.2. Motivation

The motivation for this thesis was clinical experience with parents of children with mental health problems and an interest in the potential positive and negative impacts of parenting. Parenting is a precious role to most parents, regardless of whether it is experienced as challenging, simple or as a misfortune. Concern for child well-being and development is at the core of the parental role as we see it in our culture, which, like most cultures, places heavy responsibility on parents for their child's outcome.

This psychological and cultural context of responsibility is accentuated for parents whose children are struggling with mental health problems. These parents often appear unhappy, at loss for solutions, insecure about parenting approaches and to have proliferating

family problems (Harden, 2005). Despite much research on parental mental health and parenting, the communalities and heterogeneity among parents of children with mental health problems are rarely studied in their own right.

6.1.3. Rationale

Parenting is probably a more important factor for families with child and/or parental mental health than most families because of the interactions between parenting, vulnerability, stress and protective factors (Belsky, 1984). Parenting probably mediates the psychosocial influence of parental psychopathology and other potentially pathogenic parental factors related to child well-being and mental health (Berg-Nielsen, Vikan, & Dahl, 2002; Johnson, Cohen, Kasen, Smailes, & Brook, 2001). Parenting can also moderate the influence of family or environmental disadvantage and adversity (Masten, 2001). Therefore, improving parenting is a likely strategy for improving the treatment prognosis and the well-being of children with mental health problems (Scott & Dadds, 2009).

It must simultaneously be kept in mind that parenting as well as parental mental health may very well be influenced by the strains and challenges of having a child with mental health problems (Gowers & Bryan, 2005; Taylor-Richardson, Heflinger, & Brown, 2006) and by genetic, contextual and event-related risks shared between parents and children (O'Connor, 2002).

The dominant role assigned to parents in the child psychiatry literature has been either a pathogenic factor or someone who might help the suffering child. There has been relatively little research on the parents of children referred to child psychiatry as a population in their own right. They may have their own health problems that probably interact with parenting challenges and worries about a troubled child. However, the more general reason to study such subpopulations is the understanding of parenting in general.

Community parents have been included in this thesis because they represent an important reference for the studies of parents of children referred for mental health problems; they supplement each other in their contributions to understanding parenting. The distributions of mental health problems and parenting characteristics as well as the stability of parenting are not well established among community parents and are too often not seen as a necessary reference when studying more selected subpopulations, like parents in child psychiatry settings. Therefore, a sample of adults from a large community health study and a sample of community parents are included in this thesis.

Parents of children referred for mental health problems, denoted in this thesis as clinic parents, were chosen to represent parents of children with mental health problems. A high-risk sample was sought by recruiting parents referred to family clinics following unsuccessful treatment in outpatient services. This subpopulation of clinic parents can highlight the relationship between parent and child mental health and parenting because parental mental health problems as well as parenting challenges are probably more prevalent among these parents.

6.2. Parenting conceptualizations

Parenting characteristics consist of the patterns of many everyday parenting behaviors towards a child, interwoven with parents' cognitions, emotions, attributions, attitudes and values and parent-child attachment and relationship (Ainsworth, 1989; Okagaki & Bingham, 2005). Parenting is influenced by a wide range of interactions between parent, child and other contextual factors (Belsky, 1984; Belsky & Jaffee, 2006; Marc H. Bornstein, 2009; Okagaki & Bingham, 2005). In daily life, all these general influences combine with specific child

behaviors, parental states of mind and the situational context to shape actual parenting behavior.

Despite the evident daily and short-term variations in overt parenting behavior, parenting is often described in terms of stable patterns with characterizations such as “caring” “protective” or “authoritarian” that aggregate parenting behaviors across situations and time. These characterizations approach trait-like characteristics, also denoted as parenting styles or dimensions. This thesis concentrates on the dimensional approach to parenting.

6.2.1 Parenting in ancient cultures

Actual human parenting behavior, especially with infants, show common features across cultures related to broad areas including communication, play and social interaction, denoted “intuitive parenting” by Papoušek and Papoušek (2002). However, perspectives on children and parenting show considerable cultural and historical variation. The resources, threats and philosophies of a civilization seem to have implications on ideas of parenting in contemporary and past civilizations (Harkness & Super, 2002). Historical sources such as texts, images and living arrangements can reveal variations in ideas about parenting between ancient cultures, although the scarcity and validity of old sources do not enable firm conclusions. Such sources are possibly more valid portrayals of a civilization’s values and focuses and conceptualizations regarding parenting, than the actual parenting practices of that society.

Pharaonic Egypt was a settled agricultural civilization that enjoyed a relatively stable society and predictable climate. Many sources portray close attachments, care and playful interaction between parents and children as common practice. These practices were probably valued in this culture of fairly high predictability and relatively equal legal rights for men and

women (French, 2002). The Egyptians probably recognized stage-dependent child needs regarding parenting (Colon and Colon, 1999).

Sources from ancient Mesopotamia describe a culture focused on warfare and threatening disasters. Although it was a settled agricultural civilization, unreliable climate, frequent wars and a strongly patriarchal organization of families and society were characteristic. Sumerian sources regarding parent-child relationships do not portray happy home lives. They rather discuss regulation of conflicts, rights and subordination between children and parents, primarily related to fathers. However, they also seemed to value parenting love, and associated home, or at least mothers, with a safe and protective freedom from danger (Kramer, 1963).

Ancient Israel originated from a patriarchal, herding, nomadic culture. Sources indicate the Israelites invested in the care and treatment of infants and highly valued the parenting of many children, whether those children were one's own, adopted or fostered (French, 2002). However, ancient Israeli sources do not mention toys or parents playing with their children; rather, the sources often describe family discord, crisis and resilience as well as a father figure that was loving but dominant in religious and family life (Gruber, 1999).

In the Roman Empire, the patriarchal head of the family was not primarily a parenting role. Rather the head of the family represented a level in a highly organized and strictly hierarchical society built on military power and organizational effectiveness involving the extensive use of slaves. In the available sources, the position of children was not clearly differentiated from that of the patriarchs' other subjects. Roman sources emphasize the educational aspects of child-rearing, i.e., the moral, intellectual and physical development that prepared the young for their place in society (French, 2002).

Beyond these historical fragments, conceptions and practices of parenting have probably differed significantly between and within civilizations; among subcultures, among social classes, between scholars and common families and between mothers and fathers.

6.2.2 European civilization and ideas about parenting

The historical development of ideas about parenting and children was closely connected with ideas about man (French, 2002), which was clearly illustrated in the cultural history of European Christian civilization.

Early Christianity. The highly patriarchal organization of Roman families and society was carried forward in Christian culture, and the values of patriarchal religion, the will of God and the religious understanding of man were paralleled in ideas about children and parenting. Augustine's idea that man is born sinful (H. Cunningham, Thuen, & Thorbjørnsen, 1996) implied that children required correction and discipline as dictated by the church and delegated to parents. The aim was the salvation of the soul rather than the quality of life.

In European medieval time, ideas about the soul stimulated views of children as separate from parents and different from adults. This probably influenced the criminalization of child murder and motivated the emerging literary descriptions of attachment and parents valuing their child (Ariès, Dyrvik, & Jensen, 1980). Concepts of developmental stages such as " infantia, puerita, adolescentia" were used, and a focus on learning and moderation in punishment was launched as the normative prescriptions for parenting (French, 2002).

The humanistic ideas developed in Florence in the 16th century acknowledged parent-child attachment, children's needs and rights, and the importance of parental teaching and guidance towards refinement and piety (H. Cunningham et al., 1996). The ideas that children are born as a "tabula rasa" became more prominent (although it had existed since the time of

Augustine), and this placed great importance on the hierarchical influence of teachers and parents in supplying the child knowledge (French, 2002).

The Age of Enlightenment carried forward the emphasis on learning and knowledge into secular perspectives on childhood and parenting (e.g. John Locke), where an emerging perspective on individuality urged that parenting should be adapted to each child (H. Cunningham, 2005). The radical ideas of Rousseau emphasized the ideal of a free and natural childhood in which parents and teachers are no more than the background organizers: nevertheless, he appreciated early maternal care and nursing (French, 2002).

The empirical approach of experiments with extreme adult-free upbringings inspired by Rousseau was not successful (H. Cunningham, 2005), but it was a prelude to the entry of an empirical approach to parenting that motivated the early establishment of the US Children's Bureau in 1909 (French, 2002). Ellen Key proclaimed that increased value would be placed on children during the 20th century as "The Century of the Child" in 1900 (Koops, 2005).

The value placed on children and their rights combined with a growing empirical focus stimulated the growth of pediatrics, pedagogy, child psychiatry and child protection. A protected childhood would be the ideal in the following century. This scientific and ideological focus on children built on the idea that children's needs are the guiding principle of good parenting rather than the needs of the parents, the society or the values of a religion.

6.2.3 Parenting theory development in "The Century of the Child"

In the first part of 20th century; "The Century of the Child", the understanding of parenting was dominated by the development of the grand encompassing theories of psychoanalysis and behaviorism. Learning theories emphasized teaching the child behavior through the administration of reinforcement contingencies as the core of parenting. This

perspective has metamorphosed into a recognition of the child as an agent in his/her own life, who constantly weighs short- and long-term goals, risks and benefits rather than submitting to the reinforcement contingencies (Maccoby, 2007). Psychoanalysis originally viewed ensuring the introjections of parental representations to regulate the child's biological drives as the most important aspect of parenting. The psychoanalytic emphasis on the parent-child history and internalization has been revived in recent perspectives on parent-child attachment, on their emotional relationship and on the development of self-regulation (Maccoby, 2007).

A growing interest within developmental psychology in the acquisition of concepts (Piaget, 2008), development of language (Hauser, Chomsky, & Fitch, 2002) and learning by observation (Bandura, 1974) led to a broad interest in innate processes in children. In this perspective, parenting was construed as teaching, modeling, stimulation and providing learning opportunities for the prepared structures of concepts and language to develop in each child. These cognitive perspectives are carried forward in cognitive models of problem development and treatment (Maccoby, 2007). The assumptions of innate preprogramming have merged with evolutionary perspectives and studies of animal parenting as inspiration of research on both behavior genetics and attachment processes (Maccoby, 2007).

Beginning with a focus on authoritarian personality and leadership, ideal parenting styles were promoted both as democratic parenting (Baldwin, 1948) and authoritative parenting (Baumrind, 1971). These perspectives were both advanced and challenged in the following decades by an increased focus on the child's active contribution to exploring life and accepting or rejecting parental directives and principles (Grusec & Goodnow, 1994). The contemporary understanding combines these perspectives with an emphasis on attachment and a view of the parent-child relationships as a reciprocal although unequal emotional relationship in which both parties influence and adapt dynamically to each other (Marc H. Bornstein, 2009).

6.2.4 Conceptualizations of parenting dimensions

During the second half of the “Century of the child” the global “care” concept of parenting was developed into multiple differentiations. Based on explorative factor-analyses of student and adult samples, Roe and Siegelman (1963) proposed a primary factor; ‘Loving-Rejection', a second factor; 'Casual-Demanding', and a third factor; ‘Overt concern’ implying a protective concern that was not necessarily affectionate. Bowlby's (1969) studies of animal behavior led him to focus on the maternal retrieval behavior seen among many species as a ‘protective’ function, whereas others saw this behavior as global 'maternal care' or 'nurturance'. Starting from studies of species-characteristic differences in ways of caring for and protecting offspring, Ainsworth suggested four dimensions of human parenting: sensitivity-insensitivity, acceptance-rejection, cooperation-interference, and accessibility-ignoring (Stayton, Hogan, & Ainsworth, 1971).

As a corrective non-authoritarian parenting ideal, Baumrind (1971) formulated the Authoritative parenting ideal as one of four parenting styles (also including Authoritarian, Permissive and Uninvolved) organized by the Responsiveness and Demandingness dimensions (Baumrind, 1991). However, parenting behavior is not easily categorized into such neat theoretical typologies because of the variations created by context, child behavior and parenting intentions (Maccoby, 2007).

According to Skinner et al. (2005), theoretical discussions by several authors converge on three dimensions with a content resembling the bipolar dimensions formulated by Schaefer (1965); Acceptance versus Rejection, Firm Control versus Lax Control, and Autonomy versus Psychological Control. Based on an overview of 46 instruments that use varied concepts and scales Skinner et al. (2005) extracted six unipolar dimensions that may also be seen as three bipolar dimensions (warmth and rejection, structure and chaos, autonomy support and coercion) that resembled Schaefer’s three dimension (Skinner et al., 2005).

Other researchers have suggested inconsistency (Patterson, DeBaryshe, & Ramsey, 1989), commitment (Greenberger & Goldberg, 1989) and monitoring (Darling, Cumsille, & Martinez, 2007) as important supplementary dimensions.

Although popular and attractive in their clarity, broad parenting styles, traits or dimensions have drawn criticism based on the observations of cultural variability in parenting strategies and their effects (Darling, 1993; Dwairy, Achoui, Abouserie, & Farah, 2006). Furthermore, trait approaches have been challenged by studies that illustrated the situational variability and reciprocal dynamic influence between parent and child (Maccoby, 2007).

Some of the critics of parenting dimensions and styles focus on the inherent value-bias and pathological implications (Maccoby, 2007). Child outcome may depend on individual, cultural and contextual factors that undermine such value assumptions: Warmth may be exaggerated into intrusiveness or overinvolvement (Brennan, Le Brocque, & Hammen, 2003) and children with ADHD may need unusual degrees of structure and guidance (Johnston & Mash, 2001). Some cultures may consider parenting control and authoritarianism supportive at levels that other cultures would consider oppressive (Dwairy, 2008; Stewart & Bond, 2002). Levels of protectiveness that are considered adequate in a safe society would be considered negligent in a high-crime neighborhood (Cruz-Santiago & Ramirez Garcia, 2011). Such moderators of the effect of parenting can be considered specificities of an ecological niche of parenting at a proximal level (child/parent characteristics) or a distal level (culture) (Bronfenbrenner, 2005; O'Connor, 2002).

Identifying the number of dimensions necessary to characterize parenting and the content scope of each dimension has been a lasting challenge (Skinner et al., 2005). Despite an apparent agreement on dimension names, actual item contents may diverge considerably between scales that allegedly represent the same concept. This disparity can even be observed for the ubiquitous and supposedly universal concept of parenting warmth (potentially

including acceptance, affection, appreciation, kindness, emotional availability and genuine caring). This conceptual space may lead to different item profiles or interpretations of which aspects of parenting care are most important or central. An illustration of this difficulty is Skinner et al.'s (2005) quite different item selection based on statistical criteria for their 'adult parent' and 'adolescent offspring' versions of a warmth scale. The two versions can best be describes as having 'cognitive-practical involvement' and 'love/appreciation' as their respective content profile (Skinner et al., 2005).

There is no reason to believe that a low number of dimensions can characterize parenting extensively. Yet, a low number of dimensions may still perform reasonably well at capturing the central aspects of dysfunctional parenting or ordinary parenting that may be important for child mental health (O'Connor, 2002). It may be difficult to combine psychometric reliability with the need for a wide conceptual scope (Skinner et al., 2005). Therefore, parenting research must be evaluated in light of the strengths and weaknesses of methods and instruments, especially the ability to reflect aspects of dysfunctional or ordinary parenting.

The differing conceptualizations of parenting have been based on different levels of aggregation, from specific behaviors to global traits. Historically, behaviorism has favored specific behaviors whereas psychoanalytic theory to some degree has favored more global concept (Maccoby, 1992). Later, the dimensional approach was more used in research on epidemiology and retrospective psychiatric etiology, whereas developmental research has tended more toward measures of specific behaviors. However, Darling and Steinberg (1993) proposed that parenting styles are not only a higher level of aggregation, but also act as contexts that moderates the meaning and influence of specific parenting practices in parent-child interaction. Similarly, a good parent-child relationship has been shown to moderate the risks of family mental health (Beam et al., 2011; Brennan et al., 2003), physical punishment

(Deater-Deckard, Ivy, & Petrill, 2006) and child disabilities (Bugental, 2004). Furthermore, the core of the ideal of Authoritative parenting style is a balanced combination of high Demandingness and high Responsiveness (Baumrind, 1991), or as it may be rephrased; behavior-regulation practices in the context of a caring parent-child relationship.

6.2.5 Challenges to measuring parenting

The strengths of observational methods include their potential for objective neutrality and the possibility of capturing the subtle nuances of parent-child behaviors and interactions that are not readily captured by questionnaires. However, observational methods have limitations related to aggregation across time and situations. Observations are also less easy to use when evaluating general characteristics such as global styles or dimensions of parenting, requiring meticulous operationalization to be reliably coded from behavior observations.

Parents or their offspring used as informants allow for wider aggregations, and they are able to report phenomenological perspectives, attitudes, assumptions and values. However, parents and offspring can hardly be considered neutral and objective informants, even when asking siblings about the parenting of their brother or sister (Schwarz, Bartonhenry, & Pruzinsky, 1985). Both parent and offspring informants are influenced by their own motives, relationships, states and characteristics when describing parenting behavior. Parents retrospective self-reports show a moderate correlation with and a more positive evaluation of their own parenting than offspring reports (Kendler, Sham, & MacLean, 1997; Schwarz et al., 1985). However, other studies have not found associations between parenting self-reports and the individual tendency towards social desirable responding (Mackinnon, Henderson, & Duncan Jones, 1989; Peters & Fox, 1993).

Regarding the disturbing influence from parental problems on retrospective parenting reports, psychotic states have not been confirmed as influential (Fisher et al., 2011). Results

regarding the influence of depressive states are inconsistent (Gerlsma, Das, & Emmelkamp, 1993; Lewinsohn & Rosenbaum, 1987; Lizardi & Klein, 2005; Richter & Eisemann, 2001).

When reporting on current parenting, children are possibly less reliable informants due to their cognitive limitations related to conceptual differentiation, language precision, memory capacity and recall distortions (Flanery, 1990). Parent-reports of current parenting are probably less distorted from these cognitive factors, but are more prone to socially motivated distortions (Bugental, Johnston, New, & Silvester, 1998).

Higher stability has been shown in adolescent offspring reports than in parent reports (Krampen, 1989). If parenting is actually stable, then this difference would indicate that adolescents are more accurate observers, whereas parents would be considered more accurate if parenting actually varies over time. Among family members, no informant position can be considered markedly inferior to others, and only multi-informant aggregation can increase generalizability of family reports (Schwarz et al., 1985).

6.2.6 The Parental Bonding Instrument (PBI) and its parenting dimensions

The PBI was used in this thesis as the instrument for measuring its central phenomena; parenting dimensions. The development and characteristics of PBI are therefore discussed as part of both the Introduction and Methods sections. The development and lasting controversy over the factor structure in the PBI illustrates the challenges of conceptualizing and measuring parenting dimensions.

Originally, Parker et al. (1979) expected only two factors when factor-analyzing descriptive parenting questionnaire items. When constructing the PBI, he named the first factor Care, collapsed the next two emerging factors into Overprotection and discarded the fourth factor. Parker et al. (1979) then validated these factors using two-dimensional comparison material. Later, Kendler and colleagues (1996) challenged this conclusion based

on factor-analyses using a combination of parent, offspring and twin informants. The authors asked retrospectively about first generation parenting and about second generation current parenting. They documented a better statistical fit using the three dimensions of Warmth, Protectiveness and Authoritarianism, based on a smaller selection of items.

This three-factor structure has been supported statistically in community as well as clinical samples in the US, the UK, and Japan (Cox, Enns, & Clara, 2000; Gomez-Beneyto, Pedros, Tomas, Aguilar, & Leal, 1993; Livianos-Aldana & Rojo-Moreno, 2003; Lizardi & Klein, 2005; Murphy, Brewin, & Silka, 1997; Sato et al., 1999). One or both versions (two or three factors) of the PBI have been used in 376 publications registered in ISI – Web of Science (www.webofknowledge.com) from 2000 to 2009, and the two-factor version appeared more frequently in these publications.

The intention behind the original construction (Parker et al., 1979) and later revisions of the PBI (Kendler, 1996) was to capture dysfunctional parenting. Despite the focus on dysfunction, the items for the statistically based item extraction were collected from a low-risk sample of medical students who described their childhood. After the final extraction down to four to seven items for each scale, the content scopes of the scales appear to be too narrow to capture both the dysfunctional and the supportive extremes of the dimensions. The dimensions of the PBI have been empirically associated with psychopathology risk (Heider et al., 2008; Kendler, Myers, & Prescott, 2000; Lizardi & Klein, 2002); however, these associations are not validation of whether dysfunctional parenting is reflected by the instrument.

6.3 Determinants of parenting

There is an almost unanimous agreement throughout the parenting literature that parenting is influenced by preceding factors and is constantly modified into actual behavior by the dynamic interactions between the parent, the child and their context (Marc H. Bornstein, 2009). Many of the variables suggested as determinants of parenting are associated with each other, thus, investigating each separately may result in an abundance of predictors that may represent influence, associations, mediators or moderators. Holden (1997) found more than 30 variables with documented influence on parenting. More parsimonious models has therefore been called for, still including the possibility for bi-directional and multi-factor influences (Patterson & Fisher, 2002).

In a review of the literature on child abuse (utilized as a source to understand parenting), Belsky (1984) ranked the parents personal resources as the strongest factor in shaping parenting, followed by contextual factors and child characteristics. He detailed parental developmental history, personality and current well-being as the most important parental factors, and he suggested that good parenting resources could buffer both negative contextual influences and the child's influence on the parent. Good parenting may protect against or reduce the potential negative consequences of depression in the family (Brennan et al., 2003) adoption (Whitten & Weaver, 2010), peer bullying (Bowes, Maughan, Caspi, Moffitt, & Arseneault, 2010) and exposure to violence in the family and community (O'Donnell, Schwab-Stone, & Muyeed, 2002; Ortega, Beauchemin, & Kaniskan, 2008).

In reviewing parenting models, Abidin (1992) emphasized the necessity to also consider the influence of the social context on parenting (work, events, hassles, parents' relationship, support and economy) and called for more emphasis on social-cognitive factors in parenting (beliefs and attitudes).

6.3.1 Personality and biology as influences on parenting

A review of the influence of the "Big Five" personality traits on parenting concluded that extraversion and agreeableness predict parenting positively, whereas neuroticism predicts parenting negatively (Belsky & Barends, 2002). Kendler et al. (1997) found moderate to strong influences of neuroticism on all parenting dimensions, but little influence of other personality traits. Several authors conclude that heritable temperament and personality traits mediate some of the intergenerational transfer of parenting characteristics (K. J. Conger & Conger, 1994; 2003; Tanaka, Kitamura, Murakami, Chen, & Goto, 2009).

Genetics influence temperament and personality traits with relevance to parenting (Belsky & Barends, 2002), and there are genetic components to the risk of parental mental health problems and to parenting itself (R. D. Conger, Belsky, & Capaldi, 2009; Papoušek & Papoušek, 2002). Kendler et al. (1997) estimated the influence of parents' and children's genetics on parenting warmth and found that it was substantial, mediated by child temperament, parent personality and psychiatric vulnerability, and that protectiveness was partly influenced by genetics. Other researchers have concluded with a more modest genetic influence on warm parenting (Losoya, Callor, Rowe, & Goldsmith, 1997), and a smaller genetic influence on overprotective parenting (Perusse, Neale, Heath, & Eaves, 1994) (using two-dimensional PBI). Perusse et al. (1994) proposed a genetically based non-specific teaching bias in parents who intuitively adapt didactic content to the environment and adapt parenting style to the child.

Recent research on epigenetics has increased this complexity by showing that the expression of the genetic base can be modified by parenting experience and transferred to the next generation (Belsky & Beaver, 2011; McGowan & Szyf, 2010), although these modifications are reversible (McGowan & Szyf, 2010).

Endocrinological changes in pregnant and nursing mothers seem to influence mothering behavior (Corter & Fleming, 2002), and similar endocrinological changes are also observed to some degree in partners who are closely exposed to pregnancy and child-care (Parke, 2002). Oxytocin appears to stimulate care-giving and parent-child bonding in humans and in many animals (Riem et al., 2011), and several other hormones may also play a role in these functions (Corter & Fleming, 2002). Both experimental exposure to and genetic regulation of oxytocin have been shown to affect parenting in humans (Bakermans-Kranenburg & van Ijzendoorn, 2008; Riem et al., 2011). However, it is clear that despite these influences, endocrinological influence is not necessary for the expression of parenting behavior among humans or primates (Saltzman & Maestripieri, 2011).

This thesis does not directly address the biological factors related to parenting but includes these subjects in the introduction because these factors may be relevant in discussions of parenting and mental health.

6.3.2 Parental mental health as an influence on parenting

Parental mental health has received significant attention as a potential influence on parenting, although bi-directional transactions are also likely: Parents may react differently or with altered tolerance to child problem behavior because of their own mental health problems (O'Connor, 2002).

The focus on parental mental health throughout this thesis will be limited to anxiety and depression. These symptom groups are relatively frequent in the population as indicators of emotional distress also at non-clinical levels, and they accompany many major mental health problems, among which anxiety and depression disorders are the most prevalent.

Depression is known to increase the risk of parenting problems. This influence has been especially well documented for mothers (Beardslee, Versage, & Gladstone, 1998;

Lovejoy, Graczyk, O'Hare, & Neuman, 2000) but has also been documented for fathers (Wilson & Durbin, 2010). Less sensitivity and sustained responsiveness, a less warm relationship, criticism, rejection and negative affects in interactions with the child are more frequent among parents suffering from depression (Berg-Nielsen, 2002). However, such dysfunctional parenting does not necessarily follow depression, and the associated parenting patterns may last beyond the active depressive episodes (Stein et al., 1991). Kendler et al. (1997) showed that both lifetime depression and anxiety had a negative influence on warm parenting, but not protectiveness and authoritarianism.

Parental neuroticism and anxiety, and child neuroticism and hyperactivity have been associated with parenting Protectiveness (Kendler et al., 1997). Anxious parents exert more control over their children, give less encouragement, react with more distress to children's' behaviors and emotions, communicate less and show less cohesion in families (Rutherford, 2004; Turner, Beidel, Roberson-Nay, & Tervo, 2003). However, the direction of influence is still uncertain, and controlling, discouraging parenting does not appear to be sufficient to produce anxious child behavior (Demertzis, 2008; McLeod, Wood, & Weisz, 2007; Rutherford, 2004).

Parental mental health problems and its resulting social disabilities are probably the most important source of dysfunctional parenting (Berg-Nielsen et al., 2002; Johnson et al., 2001; Wilson & Durbin, 2010). However, mental health problems or psychiatric disorders do not necessarily result in dysfunctional parenting, although they are associated with it, still, the typical qualities of some disorders are associated with increased probability of specific parenting problems (Berg-Nielsen et al., 2002).

6.3.3 The influence of learning and knowledge on parenting

The experience of being cared for, observing parenting by others and practicing infant care are all assumed to increase the probability of adequate parenting when individuals later have children of their own (Barnard & Solchany, 2002; Moore & Brooks-Gunn, 2002). This assumption is supported by primate model studies and human theory and research, although the relative importance of these learning modes is not clear (Bard, 2002). Some authors focus on the learning opportunities inherent in the transitions into becoming a parent and during the changing developmental challenges of the child (Heinicke, 2002), whereas others focus the learning implicit in the maturity stages of parenting awareness (Demick, 2002; Newberger & Cook, 1983).

However, in general, parent age in and of itself does not appear to influence parenting except for the risks associated with teenage parenthood (Moore & Brooks-Gunn, 2002). The risk that young adolescent parenthood poses to parenting quality and child outcome is likely due to less parenting knowledge, more punitive attitudes, more depression and less secure attachment (Lounds, Borkowski, Whitman, Maxwell, & Weed, 2005; Moore & Brooks-Gunn, 2002; Reis, 1989). Teenage mothers have been the targets of preventive intervention, which frequently includes their family of origin and their knowledge of and expectations about parenting (Chase-Lansdale, Brooks-Gunn, & Paikoff, 1992).

Parenting education, whether for such targeted groups or for universal dissemination has historically been based on the general idea that improved knowledge may improve parenting quality in the general population. Parenting education from the 19th century up to 1990 were based more on theory and ideology than on evaluation research (Smith, Perou, & Lesesne, 2002). Evaluations have frequently used weak methodology without experimental or statistical controls or longitudinal follow-up (Hoard & Shepard, 2005; Smith et al., 2002).

The widespread parenting education programs ”Triple P” (Saunders, 2010) and ”The Incredible Years” (Webster-Stratton, Reid, & Hammond, 2004) are examples of more recent universal and targeted prevention programs that are based on better evaluation methods documenting their outcome.

A belief in the usefulness of parenting knowledge has also motivated widespread use of advice from professionals to individuals and families in an attempt to improve their parenting (Goodnow, 2002). The effectiveness of such means of improving parenting is unclear, and the effects of this practice may differ between the general population and specific problem groups (Heinicke, 2002; Smith et al., 2002).

The educational level of parents predicts more positive parenting (Hoff, Laursen, & Tardif, 2002; Kendler et al., 1997). However, this may not result from education itself, but from the capacity to search, integrate and utilize knowledge from others and from the parent’s own experience.

Another learning influence is transgenerational modeling of parenting behavior, which according to Serbin and Karp (2003), is one of the main determinants of parenting. Attachment processes have also been considered the primary mediating process of ensuring transgenerational consistency in parenting (Hautamaki, Hautamaki, Neuvonen, & Maliniemi-Piispanen, 2010). An alternative differentiating view is that intergenerational transfer may be less influential in high-risk samples due to a stronger influence from within-generation factors, such as child and parental mental health problems (O'Connor, 2002). The intergenerational transfer of positive and harsh parenting seems robust, but research has covered less well the conditions for discontinuity across generations and the role of epigenetics in the transfer (R. D. Conger et al., 2009).

6.3.4 Child influences on parenting

Child age is known to produce adaptations in parenting to child maturity and developmental challenges (Loeber et al., 2000). However, this does not necessarily imply that more stable dimensional characteristics of parenting also change, beyond the temporary adaptations in behavior. Contemporary research has increased the focus on the influence of child factors on parenting such as the influence of child temperament, intellectual ability, gender, appearance, illness or child mental health problems (O'Connor, 2002). However, some studies have shown that the effect of child factors on parenting are limited (Jaffee et al., 2004).

Longitudinal association from child to parent may still reflect an intended and carefully considered adaptation to perceived individual child needs rather than a direct child influence (M H. Bornstein, 1998). Such parenting intentions may be highly dysfunctional ("..breaking the will of the child..") (Smith et al., 2002), may be discrepant from actual parenting behavior (Eheart & Leavitt, 1989), may reflect inadequate parent competence (Loeber et al., 2000) or may be adequately based on attitudes and understandings of children's needs (Newberger & Cook, 1983). However, separating intentions from post-hoc justifications of intuitive behavior can be difficult (Papoušek & Papoušek, 2002).

Bi-directional effects between parents and children are challenging to disentangle, and the present thesis will not attempt to address that challenge. However, the topic must be included in discussions of parenting and mental health.

6.3.5 Parenting in developmental models

According to the stress-diathesis models (Zuckerman, 1999), individual risk factors primarily result in problem development when they are combined with an unfavorable environment. The stress-diathesis model implies that the tolerance for "good-enough

parenting" is broad unless children are vulnerable. Nonetheless, dysfunctional parenting is a risk for children, and good parenting can buffer the impact of environmental risk factors (Serbin & Karp, 2004).

The transactional model of development expands these principles, in its emphasis on the dynamic interplay across the years of development. Children are able to influence their parents, to select their own exposure to experiences and influences, and influence how their experiences are interpreted (M H. Bornstein, 1998; Marc H. Bornstein, 2009).

The differential susceptibility model (Belsky & Pluess, 2009) claims that many child vulnerability factors also positively affect susceptibility when combined with favorable environmental conditions. According to all three models individual factors render children with differentially sensitive to their developmental context.

The epigenetic mechanism expands the potential effects of parenting through heritable modification of genetic expression. Thus epigenetics mechanisms even expand the potential reach of parenting beyond the present generation through genetic mediation (McGowan & Szyf, 2010).

"Generational transfer"; 2009 © C Foto

6.4 The parent population – a selected or burdened group?

When studying the mental health of high-risk parent populations, the question arises whether common adult population data represent adequate reference values. If parents have a higher or lower prevalence of mental health problems compared with the population, then adult reference values will not be adequate when studying parents and parenthood.

Hypothetically, parents could represent a positive selection of more well-functioning adults, yet, on the other hand parents could represent a strained subpopulation that experience more stressful circumstances. These possibilities can be traced to a research tradition that focuses on the associations between parenthood and mental health. The conclusions from previous original research and reviews are inconsistent, including indications that parenthood is a mental health burden (McLanahan & Adams, 1987), that parents are not better off than non-parents (Ross, Mirowsky, & Goldsteen, 1990), or that parenthood is associated with positive mental health (Kohler, Behrman, & Skytthe, 2005). Other factors that may interact with parenthood have documented associations with increased distress and mental health problems, including social disadvantages, gender, economic strain, prior divorce, widowhood, early parenthood, and caring for small children (Cleary & Mechanic, 1983; A. Cunningham & Knoester, 2007; Jackson, 1997).

Studies devoted to this topic use measures of well-being, happiness, marital satisfaction and general health or mental health, or emotional distress. Many used depression as a mental health indicator, however, only two major population studies using both genders differentiated anxiety from depression: One study found life-time associations between biological parenthood and early onset (but not late onset) depression, but not with anxiety (Turnbull, George, Landerman, Swartz, & et al., 1990). The other study lacked non-parent

comparison, but found more anxiety only among those without any romantic relationship and more depression among all non-cohabiters, compared to married parents (DeKlyen, Brooks-Gunn, McLanahan, & Knab, 2006).

6.4.1 The larger context – culture and politics

The inconsistencies reported in previous research on the associations between parenting and mental health may be due to differences in attitudes, values and political priorities between societies. These societal factors may include the organization of work, day care and schooling as facilitation of parenting tasks, and the attitudes and values about gender roles, cohabitation and the importance of child-care and family life (Abidin, 1992).

One large US study showed that the effect of family-related risk-factors for mental health (including parenthood) interacted with ethnicity (Jackson, 1997), which in the US may reflect cultural as well as socioeconomic differences. A Danish study found that both partnership and parenthood increased well-being (Kohler et al., 2005). These variations should motivate studies that separate or compare different countries and sub-cultures, because they question the assumption that family and parenting research can be extrapolated across cultural and political contexts.

As an example of potentially relevant differences, a 2006 report on public investments in children and families (Gabel & Kamerman, 2006) ranked Norway at the top of 21 OECD countries based on money spent per child in the population, expressed as the rate of gross domestic product, the rate of public spending, or the rate increase in these investments from 1980 to 2000. In contrast, the USA was ranked towards the bottom of the OECD range on all of these indicators, and showed a worsening trend across the two decades (Gabel & Kamerman, 2006).

Similar to other Scandinavian countries the cohabitation rate in Norway is 24.5% compared to 8.2% in the US (Ambert, 2005). In both countries single parenthood is still associated with poorer health, less education, and lower income. However, this is much less pronounced in Norway, where cohabiting parents are almost indistinguishable from married couples according to social and health statistics (Huserbråten, 1996; Kohler et al., 2005).

Further illustrating such differences, the US provides unpaid, job-protected parental leave for only the first three months of the infant's life, the UK provides nine months of paid parental leave in the first year, whereas Norway provides up to a full year of such paid leave (http://en.wikipedia.org/wiki/Parental_leave). Norway also has well-regulated, broadly implemented childcare facilities that adhere to high quality standards(OECD, 2007), investing most heavily between the OECD countries (Gabel & Kamerman, 2006).

6.4.2 Subgroups, special situations and comparative references

Epidemiological studies indicate a somewhat increased risk of depression among postpartum women (Eberhard-Gran, Tambs, Opjordsmoen, Skrondal, & Eskild, 2003) and a higher psychiatric hospitalization risk among first-time parents (Munk Olsen, Laursen, Pedersen, Mors, & Mortensen, 2006).

However, many wide-reaching conclusions implying that parenthood is a negative mental health factor have been drawn from studies without adequate comparisons to groups of non-parents (Avison & Davies, 2005; DeKlyen et al., 2006), single persons (Carlson & McLanahan, 2006; A. Cunningham & Knoester, 2007), or even fathers (Afifi, Cox, & Enns, 2006; Flowers, Schneider, & Ludtke, 1996; Wade & Cairney, 2000). Likewise, many studies focus selectively on early parenthood (Mirowsky & Ross, 2002), single parenthood (Brown & Moran, 1997), the transition into parenthood (Nomaguchi & Milkie, 2003), or union transitions (Wade & Cairney, 2000) all of which represent variations and stages in parenthood

rather than the decades-long career of an active parent. The inconsistent results could well be explained by the variation between multiple and interacting groups of variables associated with different sources of strain and selection. These factors can only be explored in combinations in large-scale studies.

Large-scale studies of parental mental health also suffer weaknesses. Many originate from the US National Survey of Families and Households (NSFH) which shows that non-custodial fathers (Knoester & Eggebeen, 2006) (N = 3,088), single parents (A. Cunningham & Knoester, 2007) (N = 3,975), and adolescent parents (Heath, McKenry, & Leigh, 1995) (N = 1,259), all suffer higher depression scores. There was only a marginally higher depression among parents overall, yet Evenson et al. (Evenson & Simon, 2005) (N = 11,473) concluded that parenthood is a risk because all of the parent groups scored higher than their equivalent non-parent group. However the NSFH study was not representative because it used a strategic oversampling of Blacks and Hispanics, cohabiting and recently married persons, single and stepparents and it counted non-custodial and empty-nested parents as parents (Evenson & Simon, 2005) (N = 11,473). A large UK study only found increased risk for single persons and single parents (Harrison, Barrow, Gask, & Creed, 1999) (N = 38,014). From the Canadian National Population Health Survey database (NPHS) increased risk among single parents were reported, but no parenthood effect (Avison & Davies, 2005) (N = 5,598) Ross et al. (1990) concluded in a review that marriage contributed to health, whereas parenthood did not give any health change. However, a large twin-study controlling for genetic endowments concluded that partnership and the first child contribute to well-being (Kohler et al., 2005) (N = 5,412). Thus, the pattern indicates that factors that may be confounded with parenthood are sources of risk, whereas the effect of parenthood itself seems uncertain.

This uncertainty was addressed in Study I.

6.5 Parenting Stability

Parents continually change their overt parenting behavior in response to a variety of interacting factors, such as specific child behaviors, ideas about parenting, parental state, and the circumstances of each given situation. Even higher-order parenting characteristics (dimensions or style) may be unstable and show some short-term changes across weeks and months (Parker et al., 1979). These changes represent true fluctuations rather than random measurement errors. The group mean levels of parenting characteristics have been shown to follow long-term adjustments across the years of development (Loeber et al., 2000), presumably as a targeted adaptation of parenting to child maturity (Holden & Miller, 1999). However, the mean-level change is usually negligible within moderate periods of up to one year (Loeber et al., 2000).

Bugental, Johnston, New and Silvester (Bugental et al., 1998) called for greater attention to the stability of psychological characteristics over and above the commonly evaluated short-term test-retest reliability of the instruments used to measure those characteristics. When stability has been addressed, it has often been confused or equated with reliability, which is exclusively focused on measurement error rather than true change.

The true stability of a phenomenon has often been only implicitly assumed, and the observed stability characteristics of the instruments are frequently ignored as a psychometric quality different from reliability. This has been the case for the three-dimensional (Kendler, 1996) and the current parenting versions of the PBI. In general, short-term stability of parenting has been studied almost exclusively in regards to younger children (Holden & Miller, 1999). Thus, some basic information has been unavailable regarding the parenting of older children in general and current parenting more specifically. This lack of information leaves us with only theoretical assumptions of stability. Studies of individual-level stability of

parenting are rare. So far, only a study related to toddlers has been located regarding parenting (Verhoeven, Junger, van Aken, Dekovic, & van Aken, 2007).

The only extant review of parenting stability concluded that " child rearing is simultaneously enduring and different" (Holden & Miller, 1999). The expected stability of parenting dimensions across short-term periods of months is not clear given the multitude of factors that influence parenting, ranging from fluctuating states and dynamic interaction processes to highly stable factors (Belsky & Jaffee, 2006; Marc H. Bornstein, 2009; O'Connor, 2002). The change in some influential factors may occur quickly for a specific family, even across the time-span of a specific situation, of hours or of days. However, the impacts of such fluctuations on the dimensional characteristics of a person's parenting may lag and accumulate more slowly.

Very few studies on parenting stability have been published since the Holden review (1999), and the imbalances and gaps in the parenting stability research at that time are still not adressed. Although not pointed out by Holden, the review shows that the stability literature is scarce on time frames less than a year in combination with parenting of older children. Furthermore, the estimated true stability of parenting seem absent in research, and studies on individual-level stability are rare except for the toddler study by Verhoven et al. (2007). In general, most of the evaluated parenting stability studies focus on only one stability characteristic and rarely compare parenting to other psychological phenomena.

This has been addressed in Study II.

6.6 Clinic parents

Parents of children who were referred to child psychiatric treatment, clinic parents, were selected as the second target population of this thesis. Families who are referred to

family clinics in child psychiatry were selected because they are expected to represent high risk. These families often have multiple known problems among their family members (Sundet, 2009). Clinic parents may differ from parents of children with mental health problems in the community due to self-selection and selection by professionals. These families do not represent untreated cases. In this group, both the parents and the children have already received some help in terms of community services, and assessment and treatment in outpatient child psychiatry. This selection process and service history may have influenced both the parents and the children, although they are still considered unsuccessfully treated cases.

The duration and guiding principles of the stages of referral to child psychiatry are largely unknown, although both US and Norwegian studies show that poor family functioning, poor parent-child attachment and perceived burden by parents are strong predictors of selection into specialized mental health services, but only partially mediate child symptoms and impairment (Angold et al., 1998; Reigstad, Jorgensen, Sund, & Wichstrom, 2006). However, service selection processes may differ between countries due to difference in systems and traditions. Service access may also be positively influenced by parental human resources, used in advocating on behalf of their children.

Thus, the characteristics of clinic parents in contrast to community parents may not necessarily appear to be increasingly dysfunctional corresponding to these service levels. Previous treatment may have imparted some benefits to the family, and human resources used in gaining access to services may reduce their likelihood of dropping out from treatment and research (Kazdin, Mazurick, & Bass, 1993).

Clinic parents are rarely studied as subpopulations in their own right, either in Norway or internationally. Knowledge about clinic parents sometimes originates from narrowly selected samples that are based on specific types of child problems in clinical treatment

research trials. However, such clinical trials do not encompass the heterogeneity of children's problems encountered in specialized services, especially the unsuccessfully treated cases.

6.6.1 Characteristics of parents whose children have mental health problems

Traditionally, the parents' mental health and parenting problems have primarily been viewed as risk factors when observed together with child problems (Angold et al., 1998), although clinicians are becoming increasingly aware of the heterogeneity among clinic parents, the bi-directionality of effects between child and parent (O'Connor, 2002), and their shared risk factors. Among clinic parents, parenting and parental mental health may very well be influenced by the strains and challenges of having a child with mental health problems, probably increasing with child problem severity (Gowers & Bryan, 2005) and problem duration (Early, Gregoire, & Mcdonald, 2002). As many as 10 percent of community parents experience burdens in their parenting role due to their child's mental health problems (Angold et al., 1998), and many of these parents are known to suffer from self-blame (Moses, 2010) and mental health problems (Sawyer et al., 2002).

Assuming a parenting pathogenic effect, the parents of children with mental health problems would be expected to show a higher prevalence of dysfunctional parenting and a higher level of risk-factors associated with parenting problems like personality deviance, dysfunctional parenting in the previous generation, and mental health problems. (O'Connor, 2002). What characterizes parents in the heterogeneous population encountered in clinical services has largely been unknown, as has the naturalistic course of their emotional distress symptoms and parenting following involvement in their child's treatment.

6.6.2 Consequences of parental inclusion in child treatment

Research rarely focuses on what happens to parents while they are involved in clinical services aimed at their children's mental health problems. The naturalistic influence of child

illness and child treatment involvement among parents has been studied to some extent in pediatric settings (Melamed, 2002), but has been evaluated much less among parents in child psychiatry. This has probably partly been so because parents in child psychiatry have been considered more as potential risks. However, clinic parents in child psychiatry should be considered also as a potential resource and as affected relatives.

In child mental health treatment research, the inclusion of parents and parenting in interventions has been shown to increase adherence (Hawley & Weisz, 2005; Nock & Ferriter, 2005) and treatment outcome and maintenance (Carr, 2009; Diamond et al., 2010; Mendlowitz et al., 1999), especially in cases when the parent and the child share anxiety problems (Cobham, Dadds, & Spence, 1998), and with individuals who were not reached or initially did not respond well to treatment (Scott & Dadds, 2009).

Parents who are involved in child psychiatric services may profit considerably in ways that are significant for themselves and their children, but their engagement can also represent considerable emotional and practical burdens. Parents are frequently included in assessment and treatment, and studies from Norway have shown that child psychiatry services have approximately the same amount of contact with parents as with adolescents (Israel, Thomsen, Langeveld, & Stormark, 2004). Parental involvement was relatively higher in the pre-pubertal ages, related to externalizing disorders and in families having experienced divorce (Israel, Thomsen, Langeveld, & Stormark, 2007a).

Parents of somatically ill children, who should be similar parents in child psychiatry in many ways, have been studied more than clinic parents in child psychiatry (Melamed, 2002). Parents of children with chronic somatic disorders or a severe disability show increased anxiety, depression and anger (Hatcher, Richtsmeier, & Westin, 1989; Horsch, McManus, Kennedy, & Edge, 2007). Accompanying children to unexpected paediatric intensive care leaves 40% of the parents with subclinical or clinical PTSD symptoms three months after the

incident, and 28% still experience PTSD symptoms nine months after (Berenbaum & Hatcher, 1992).

These findings suggest that similar parental consequences may be found among parents in child psychiatry. Some of the occurrence of parental emotional distress encountered in child psychiatry may result from the burdens and worries related to child problems, and may drop as a result of the assessment and treatment of children.

This was focused in Study III of this thesis.

7. RESEARCH QUESTIONS

7.1 First Research Question (Study I): Anxiety and depression in the population

This first research question pursued in Study I addresses the previously ambiguous results regarding associations between parenthood and parental emotional distress. In this study, adults 30 to 49 years of age in a large community health study were selected because these are the decades with the highest prevalence of parenting. The analyses were controlled for age, gender, education and social class.

1) Is parenthood associated with emotional distress in the community population, when distinguishing between those who are single, married, cohabiting or divorced?

7.2 Second Research Question (Study II): Parenting stability

The second research question pursued in Study II addressed the stability of parenting dimensions across nine months related to older children, 8-16 years old in the community. The dimensions of Warmth, Protectiveness and Authoritarianism were differentiated regarding multiple statistical indicators of stability. The stability of other parental

characteristics was used as a comparative framework, and parental predictors of stability and change were sought.

2a) What are the characteristics of stability and change among community parents for the three current parenting dimensions of Warmth, Protectiveness and Authoritarianism?

2b) Are parental characteristics such as personality, received childhood parenting, anxiety and/or depression associated with the stability of current parenting dimensions?

7.3 Third Research Question (Study III): Naturalistic clinic course

Parents are rarely followed in treatment studies unless they are systematically targeted by manualized treatment components. Thus, what happens to clinic parents following naturalistic participation in treatment that primarily target their children is largely unknown.

3a) Do the dimensions of parenting or parental emotional distress change over the stages preceding, including and following "treatment-as-usual" in inpatient family clinics?

3b) If longitudinal change does occur, does it depend on parental or child characteristics?

8. METHOD

8.1 Data-materials

Three samples were used either separately or in combination to address the three research questions in this thesis. Two samples (the Community and Family clinic samples) were recruited for the purpose of this thesis, and access to a population sample (the HUNT2 study) was granted. Table 1 shows how the samples were utilized in Studies I to III.

The samples came from a broad area in mid- and western Norway that included coastal and inland rural communities, towns and two cities. This population was relatively

stable, and the ethnicity was homogeneous at the time of the studies, including only very small elements of non-western immigrants (<1%) (Dzamarija & Kalve, 2004) and indigenous people (<1%) (SSB, 2006). The number of children per family ranged from one to six with the mean varying only slightly from 2.6 to 2.8 between the Community and Family clinic samples respectively. Child characteristics were not known in the HUNT2 and child mental health information was not available in the two community samples.

8.1.1 Population sample from the North-Trondelag Health Study 2 (HUNT 2)

The HUNT Research Centre supported this study by granting permission to access data on 24,040 parents and non-parents from the HUNT2 (the second wave of The Nord-Trondelag Health Study) including information on anxiety, depression, demographics an control variables. These data were used in Study I, which addressed parental mental health.

The Nord-Trondelag Health Study (HUNT) was conducted collaboratively between the HUNT Research Centre, Faculty of Medicine, Norwegian University of Science and Technology (NTNU), the Norwegian Institute of Public Health, and the Nord-Trøndelag County Council. The second wave HUNT2 was a non-sampled data collection that invited the majority of the total adult population 20 to 100 years old in the Nord-Trøndelag county of Norway (Holmen et al., 2003). Thirteen percent of the non-responders (4% of all those who were invited) were unwilling to participate in the study, 21% of non-responders forgot to complete the instrument, and 66% of the non-responders were impeded in doing so due to health problems, travel or work demands (Holmen et al., 1990).

To reduce ambiguity regarding parenthood, the HUNT2 excerpt was restricted to adults ranging from 30 to 49 years of age. Including the 20-30-year-olds would have added few additional parents and many future parents would have been defined as non-parents. Including adults older than 50 years would have polluted the non-parents group with many

"empty-nest" former parents. The prevalence of social parenthood in the sample was 65% for women and 56% for men. The selected age-span included 75% of all current social parents in the HUNT2. The original response-rate in this age-span was 72%. Exclusion of those with partially missing data resulted in a 70% response rate in the final sample of N = 24,040.

Table 1. Combination of studies/research questions (RQ) and samples with sample characteristics. Columns represent samples and subsamples at time-points (T0-T1-T2-T3).

	HUNT population	Community parents	Family clinic parents
Study I RQ1 Parental emotional distress	N=24,040 Cross-sectional		
Study II RQ 2 Parenting stability		T1/T2 N=150 +9months Longitudinal	
Study III RQ 5 Clinical parents followed during child and family treatment		T1 N = 442 Reference Cross-sectional	T0 = 15 Waiting list T1 N=151 Admission T2 N =102 + 3months T3 N = 64 +12months
Parent N, age *M* (range) Male/Female %	N = 24,040 40.4 (30-49) 48/52 %	N = 442 40.5 (26-58) 41/59 %	N = 102 (three clinics) 38.6 (29-56) 46/54 %
Child age *M*(range) Boy/Girl %		11.4 (7-15) 55/45 %	10.6 (7-16) 70/30 %

Strengths and limitations. The recruitment of a population sample of considerable size and a high response rate represents a considerable strength in supporting the conclusions. The low prevalence of non-western immigrants in the HUNT2 (3%) may hamper comparability to the more heterogeneous populations of some other countries and may underestimate

psychiatric morbidity (Eystein Stordal, 2005). However, in Study I, the low immigration rate was a strength for the comparison of the influences of Scandinavian culture, family attitudes and politics on the results with studies from other countries.

The family information available in HUNT2 represented a potential source of error. Social parenthood had to be deduced from household composition information, which may have led to erroneous results in extended households that included several generations of adults; however, this was a rare situation in the area. Furthermore, the social status information did not distinguish between first and repeated marriages among those married. Thus, the analyses regarding previous divorce in Study I could not differentiate those in a second marriage following an earlier divorce. Finally, no information about previous cohabitation was available for the single individuals.

8.1.2 Community parent sample

Data were collected from parents in the community at two timepoints nine months apart (T1 and T2). Parents were invited from 20 classes at 14 public schools in two counties, including a small city and its surrounding districts and towns. Of 558 eligible parents, 442 participated at the first timepoint, T1. Half of them (n = 220) were randomly selected to participate again at T2, and 150 did so (68%). The final sample at both T1 and T2 included different urban areas, small towns and rural districts. Private schools or special schools were almost non-existent. The longitudinal T1-T2 data were used to investigate parenting stability in Study II, whereas the T1 data were used as reference data representing community parents in the stability analyses of Study II and in Study III.

Strengths and limitations. To gain access to the parents while recruiting the Community sample, the researchers were dependent on the motivation and good will of schools and teachers. The random selection of schools and balancing of child ages would have

been undermined if many schools refused to cooperate or teachers had not voluntarily aided recruitment. The initial schools were indeed selected randomly within the following three areas: 50% from combined town/rural areas, 25% from low-income city areas and 25% from high-income city areas. However, if one school refused to participate, a replacement school was used. Paired replacement schools had been preselected randomly with the constraint that a balanced sampling between areas was maintained.

The ranges of pupils' ages were balanced between the defined areas. The effects of these circumstances on the selection of the participating parents were probably minor, although they cannot be ruled out. Due to a near complete lack of private or special schools, each class constituted a reasonably representative sample of parents with school-age children in their area. However, the areas represent a balance between low, moderate and high status areas, although the variation in population socioeconomic status between areas was moderate.

The analysis of the schools and classes did not indicate any significant differences between the parents, and the similarity of anxiety and depression scores on the Hospital Anxiety and Depression Scales (HADS) compared between the HUNT sample and the Community sample indicated that the Community sample was representative of parents in the area. Whereas the representativeness of the sample was of moderate importance when examining the comparative stability across time in Study II, using this sample as a community reference in Study III presupposes that it was a representative sample.

It was a weakness of the sample that there was no available information on the actual distribution of socioeconomic variables in the sample, and no information about child problems variables.

8.1.3 Family clinic sample – Parents in child and adolescent psychiatry

Parents of children referred to three family inpatient clinics in child psychiatry participated in Study III, a naturalistic longitudinal study completing questionnaires at multiple time points (T0-T1-T2-T3) at referral, admission, three months and 12 months after discharge. Clinical diagnoses were collected.

A total of 160 parents were invited to participate in the study prior to admission, 151 parents agreed to participate and 139 completed data collection at admission (T1), 102 participated at 3month follow-up (T2) and 64 at 12month follow-up (T3). This represented response rates of those eligible of 87%, 64% and 40% at T1, T2 and T3, respectively.

Due to practical problems, as often occurs in naturalistic settings, the T0 measurement was only collected from a subsample of 15 out of the last 16 parents invited into the study at one clinic (representing 9% of those eligible, 15% of T1-T2 participants). Thus, the T0 measurement could only be used as a supplementary exploration of the stability of the T0-T1 responses and is not included in the flowchart Fig.1. T0 took place in connection to referral, prior to a waiting period that averaged eight weeks.

Regarding child referral reasons, child age, child gender or parental age there were no differences between those who declined to participate versus participants according to clinic reports. Within the sample there were no significant differences at T1 between those dropping out versus responders at T2 or T3. The children had on average more than five years of service history (range 2 to 8), in community and specialized services before referral to the inpatient family clinic.

Strengths and limitations, clinic parent studies. Due to selection processes, the Family clinic sample was not representative of the untreated population of community parents with mentally ill children but may represent unsuccessfully treated cases in the clinic population.

The naturalistic design was weakened by an unspecified content of the previous guidance and treatment in community services and later the assessment and treatment in the outpatient psychiatric services and in family clinics.

The differentiation between child diagnostic groups was not planned as a primary aspect of Study III or this thesis. This resulted in less reliable diagnostic procedures with partly lacking evaluations. The naturalistic design also implied an unbalanced distribution between diagnostic categories, and following major difficulties in analyzing and interpreting the results regarding specificities and differences between groups of diagnostic categories.

The relatively low prevalence of comorbidity in the family inpatient sample calls into question the validity of the diagnostic evaluations in a sample with long-standing unsuccessfully treated child problems, where considerable comorbidity should be expected.

8.2 Measures

The following group of questionnaires was used in two or three of the data sets in this thesis: two versions of the Parental Bonding Instrument (PBI), The Hospital Anxiety and Depression Scales (HADS), and a Norwegian short-version of the NEO-PI personality inventory (NEO-PI(sv)).

In the clinic sample, information on child psychosocial problems was collected using the Child Behavior Check-List (CBCL), which is the parental report from the Achenbach System of Empirically Based Assessment (ASEBA).

8.2.1 Parental Bonding Instrument versions

Parenting dimensions rather than specific parenting behaviors were chosen to represent parenting, to enable a broad but specified approach that could embrace heterogeneous parent groups. Three parenting dimensions, Warmth, Protectiveness, and

Authoritarianism, assessed with the Parental Bonding Instrument (PBI) (Parker et al., 1979) as revised by Kendler (1996) were chosen for the thesis. Kendler (1996) reduced the number of items from 26 to 16, and extracted three dimensions rather than two: Warmth (7 items), Protectiveness (5 items) and Authoritarianism (4 items).

In addition to the original retrospective offspring report, Kendler (1996) also adapted the PBI items to a current offspring version, and current and retrospective parent self-report versions. In this study the offspring version was used to report on 'retrospective childhood parenting' of adults who have now become parents themselves. The offspring version of PBI separates between parenting received from mother, PBI-M; and father, PBI-F; these measures are here referred to jointly as PBI-M/F. The adults were also given the parent self-report version, PBI-PCh, to describe their current parenting of their child. PBI-PCh and PBI-M/F produce scores for the same three dimensions using equivalent items with adapted wording.

Later versions with both two- and three-factor structure have expanded the use of PBI to ask older child/adolescent offspring about current parenting. Regarding reliability and validity, many of these versions have not been thoroughly tested, although the original retrospective PBI has been well evaluated psychometrically and validated among adult offspring (Mackinnon et al., 1989; Parker, 1989; Parker et al., 1979). The re-test correlations of the six retrospective PBI-M/F scales have been shown to be within .64 - .87 across 2.5 years and .58 - .74 across 10 years (Lizardi & Klein, 2005).

The Kendler study (Kendler, 1996; Kendler et al., 1997) included an evaluation of factor structure and cross-informant reliability across seven classes of offspring and parent retrospective and current parenting informants. For another 25-item 3-factor version of the PBI-M/F Gomez-Beneyto and colleagues (1993) reported *alpha*s from .77 to .93. We have not found reliability or validity studies regarding the use of the PBI to specifically characterize

current parenting. In Study II, the six PBI-M/F scales showed *alpha* coefficients from .86 to .76 compared to the three PBI-PCh scale *alphas* of .77, .69 and .51 (Warmth, Protectiveness and Authoritarianism respectively).

Strengths and limitations. The strengths and limitations of the PBI are difficult to summarize because of the many version that exist based on either the original two-factor structure (Parker et al., 1979) or the revised three-factor structure (Kendler, 1996).

The PBI illustrates the informant and perspective dilemmas when measuring parenting. The majority of studies using the PBI focus on adult psychiatric outcome related to retrospective childhood parenting. Self-reported parenting; using parent as informants, is much less common both for previous parenting of now adult children or current parenting of present children. It is problematic that the validity, reliability and stability characteristics of the "current parenting" versions of the PBI are not documented.

The concerns regarding scale and content scope mentioned in the introduction must be considered as a weakness of the instrument. In Study II, the internal consistency *alpha*s for current parenting dimension (PBI-PCh), especially for Authoritarianism (*alpha* = .51) although unidimensionality was indicated (*CFI* = .98), were lower than those reported for retrospective versions of the PBI in Study II and in previous studies.

The use of single informant self-reports in PBI-PCh was a weakness of Studies II and III which could have allowed the use of multi-informants reports to increase accuracy.

8.2.2 Hospital Anxiety and Depression Scales (HADS)

The HADS (Zigmond & Snaith, 1983) is a self-report measure of anxiety and depression designed as a functional screening instrument for community and health service settings (Herrmann, 1997), used in more than 800 journal papers (Psychinfo, November 2011, http://ovidsp.uk.ovid.com/). It produces separate scores for anxiety (7 items) and depression

(7 items). A score of eight or above was used as a clinically relevant level, indicating, but not defining a psychiatric disorder (Herrmann, 1997). This cut-off has been validated in many studies reviewed by Bjelland et al. (2002) including a Norwegian sample (Hammerlid et al., 1999). Validation and psychometric properties including factor-structure of the Norwegian version as well as other versions has been evaluated in several studies (Bjelland et al., 2002; Herrmann, 1997; Mykletun, Stordal, & Dahl, 2001). Mykletun et al. (2001) reported scale *alpha*s of .76 (depression) and .85 (anxiety) in the HUNT2 study.

Strengths and limitations. In addition to its wide use in research, the strength of the HADS is its acceptability, sensitivity for milder psychopathology but also high specificity (E. Stordal et al., 2001). A criticism raised against the HADS is that it produces similar gender scores and prevalence of depression (i.e. higher among men) compared to most depression instruments (reviewed by Wilson & Durbin, 2010). However, this was not central to the present research questions.

8.2.3 NEO-PI-R(sv) – personality inventory

For this NEO-PI version many scale fit indicators were reported from the original samples, but not *alpha*s or stability correlations, and later psychometric reports have not been found. In Study II, NEO-PI(sv) *alpha*s scaled from .63 to .91.

Strengths and limitations. The NEO-PI(sv) (Vassend & Skrondal, 1995) used in Studies II and III was the only translated short-version of the NEO-PI-R available when the studies were conceived. Other versions are now available (Martinsen, Nordvik, & Ostboe, 2005). After the studies in this thesis were initiated, it came to our knowledge that criticism had been raised against this version because it redistributed some of the domain scales especially the Extraversion scale, and constructed new subscales (facets). Study II showed

low internal consistency (*alpha*), scale unidimensionality and stability for some of the domains, especially Extraversion but also for the Conscientiousness domain. Neuroticism was the domain scale least altered by the item redistribution, and it showed high internal consistency (*alpha*), scale unidimensionality and stability in Study II. Consequently, the Extraversion and Conscientiousness domain scales were not used in Study III. The scale appearing most frequently in the main results of this thesis was Neuroticism, which should be an acceptable representation of the original NEO-PI domain.

Table 2 Instruments, scales, scale items and scaling.

	Scales	Items	Scale
HADS: Hospital Anxiety and Depression Scales	Anxiety and Depression	7 and 7	0-3
PBI-PCh: Parental Bonding Instrument - Parent-Child	Warmth, Protectiveness and Authoritarianism	7, 5 and 4	1-4
PBI-M/F: Parental Bonding Instrument - Mother/Father	Warmth, Protectiveness and Authoritarianism, two sets	7, 5 and 4; 2 sets	1-4
NEO PI(sv): Big Five Personality Inventory – Norwegian short version (Vassend and Skrondal, 1995)	Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness	29, 14, 12, 26, and 19	0-4
CBCL: Child Behavior Check List	Anxiety, Depression, Somatic complaints, Social-, Thought-, and Attention Problems, Rulebreaking and Aggression	13, 8, 11, 11, 15, 10, 17 and 18	0-2

8.2.4 The Child Behavior Checklist (CBCL)

CBCL problem scales were used to measure parents' accounts of their children's psychosocial problems. The CBCL is part of a multi-informant assessment battery of competencies and emotional/behavioral problems, the Achenbach System of Empirically Based Assessment (ASEBA) (Achenbach & Rescorla, 2001). The problem scales of the CBCL consist of 120 items across eight subscales. The three scales Anxious/Depressed, Withdrawn and Somatic Complaints, form the broadband Internalizing Problems scale; the three scales Attention problems, Rule-Breaking Behavior and Aggressive Behavior form the broadband Externalizing Problems scale; and finally Social problems and Thought problems add to the Total Problems score together with the other scales. The Norwegian version of CBCL was translated in 1991 by Novik and colleagues and has shown acceptable validity and internal consistency *alpha* from .90 to .93 for 'Total problems' (Novik, 1999a, 1999b).

Strengths and limitations. The strength of CBCL is its wide clinical and research use in Norway (Novik, 1999a) and many other countries, and its well documented validity and reliability across countries (Rescorla et al., 2007). Its psychometric properties and validation have also been well documented in Norwegian samples (Novik, 1999b, 2000). The standardization samples used in Norway have suffered from a low participation rate (Novik, 1999a) but a recently published study replicated the problem score levels in a study with larger sample and better response-rate (Jozefiak, Larsson, Wichström, & Rimehaug, 2011).

8.5 Statistical challenges and solutions

8.5.1 General statistical analyses

Differences between group and sample means were analyzed using ANOVAs and Bonferroni posthoc test. Differences in anxiety or depression prevalence were analyzed with Chi^2 or with odds ratios (*OR*s) in logistic regression. Group contrasts of prevalence rates and dichotomous variables were tested with Chi^2 2x2 tables. Two-way group differences or changes in continuous variables upon repeated measurements in relation to parent or child characteristics were tested with a GLM repeated measures analysis.

Differences between correlations were tested for statistical significance by converting each difference to a *z*-score relative to sample size and examining its probability (Fisher's transformation). Differences between percentages were tested with one-sample binomial tests. To examine correlations between continuous variables, the Pearson product-moment correlation coefficient was used, and was denoted ***r*** (in bold) for repeated measurement stability correlations and *r* for ordinary correlations. Internal consistency was evaluated with Chronbach's *alpha*.

8.5.2 Unbalanced and interacting demographic grouping factors

The unbalanced group sizes and multi-colinearity between the grouping factors in the HUNT2 sample represented statistical challenges. Accordingly, the ordinary logistic regression approach (entering parenthood, current partnership and divorce as separate factors into joint regression models) resulted in unstable models and possible Type II errors, especially when allowing for interaction effects in the analytic models.

To avoid this problem, a combined family status grouping (parenthood x married-cohabiting-single x divorced) was used for multiple simple comparisons between subgroups in logistic regressions. Subgroups defined by these three grouping factors enabled a

conservative statistical strategy and meaningful representation of interactions. The extensive HUNT2 dataset allowed this to be performed without a loss of statistical power. Contrast comparisons were performed by selecting pairs of subgroups for specific comparison, or using 'married parent' as a common reference group for the other subgroups.

8.5.2 Hierarchical cluster sampling: schools, clinics and families

Recruitment processes or membership in hierarchical or related subgroups within a sample may influence the statistical associations and produce false results. The community parents were recruited family-wise through schools in groups (school-classes), implying possible differences between families, schools or groups (three cluster levels). The Family clinic sample families were recruited at four clinics (two cluster levels: families and clinics). Effects from these cluster samplings may have required multilevel analyses to control these influences.

However, a comparison of the sampling groups in an unconditional random-effect regression model did not reveal significant group sampling contributions to the variance of any of the 16 instrument scales between the sample clusters in the Community and Family clinic samples. Furthermore, in the Family clinic sample, level or change in emotional distress or parenting dimensions was not significantly correlated within families (mother/father), and was not significantly different between the three sites included in the Family clinic sample.

Establishing this justified the decision not to use a multilevel approach in the analyses of the Community and the Family clinic samples.

8.5.3 Standardizations across samples

The data from the 16 instrument scales in the Community and Family clinic samples were converted to gender-relative z-scores based on Community parent T1 values ($N = 442$ community parents) and used in Study II and III. The conversion was performed to allow a

direct comparison of levels and differences in the common metric; *z*-score (level) and Δz (difference). Gender-relative conversion was chosen because several of the 16 scales showed significant gender differences.

Using the gender-relative z-conversion in analyses implied that raw-score gender differences were controlled for in the analyses. Thus, the use of the standardized scores represented a complication in interpreting gender interactions in two-way ANOVAs that included gender as a factor, because the standardization procedure already compensated for gender differences. To avoid any confusion created by this, such analyses were performed on raw-scores. However, analyses based on z-scores resulted in identical conclusions when interpreting gender effects as gender interactions.

8.5.4 Statistics for evaluating and comparing time stability

The stability correlations in Study II were calculated as Pearson's product-moment correlations. When significant change in mean level was found, intra-class correlations would have been a more proper choice, but this was not the case for the repeated measurements in Study II.

True stability estimates, r^{SEM} were calculated as the regression term γ of the T1 → T2 latent scales regression in Structural Equation Modeling (*SEM*), following procedures described by Jöreskog and Sörbom (1996). Calculations were performed separately for each of the eight subscales in Study II.

Change in *z*-scores Δz was used as the basis for calculating prevalence of stability or instability in the individual level of scores. Because no standards are established for defining such categories of stability or change, an adaptation of Cohen's (1992) recommendations was suggested. Cohen proposed z = .20, .50 and .80 as characteristic of small, moderate and large change in standardized group mean, respectively. Because our focus here was absolute

individual change, which is more influenced by measurement error than group mean change, it was pertinent to set the lower limit for a considerably changed score at one standard deviation: thus $\boldsymbol{P}|\Delta|>1z$ was calculated to represent expectancy rate (denoted '*changed*' when referring to this definition). In a similar way one half of a standard deviation was chosen as an upper limit for negligible change: thus $\boldsymbol{P}|\Delta|<0.5z$ was calculated as the expectancy rate denoted '*no change*'. The intermediate range from $0.5z$ to $1.0z$ absolute change was considered uncertain change.

Comparison of the observed stability characteristics between instruments and scales relied on the assumption of equal psychometric qualities between the scales: their unidimensional qualities were evaluated based on the Comparative Fit Index (*CFI*) for each scale calculated in LISREL, and considered acceptable if they exceeded .80 (Rogers, Schmitt, & Mullins, 2002). Their internal consistency was evaluated with Cronbach's *alpha*; however, because *alpha* is influenced by item number and the scale lengths here varied from four to 29 items, the average inter-item correlation was also calculated as a supplementary indicator of consistency (Cortina, 1993).

9. RESULTS SUMMARY

9.1 Anxiety and depression in the parent population

The overall comparison of parents to non-parents in the large population study HUNT2 showed only a weak tendency towards less emotional distress among parents. When controlling for age, gender, education and social class only anxiety but not depression remained significantly lower among parents. However, when dividing into subgroups based on whether the subjects were 'single, cohabiting or married' and combined with 'divorced or not', the parent – non-parent contrasts were not significant for any subgroup, and their trends

towards a difference went both ways. Single parents showed systematically higher anxiety and depression than married and cohabiting parents, but not in contrast to single non-parents. Single status in itself was the strongest predictor of anxiety and depression, not whether the single person was also a parent.

Anxiety was higher in association with single status and previous divorce, whereas depression was higher only in association with single status. Cohabiting parents were no different from married parents in emotional distress unless they were previously divorced.

9.2 Parenting stability across nine months among community parents

Based on observed stability correlations, true stability estimates from structural equation modeling and the distribution of individual-level change, a consistent picture of the relative stability between parenting dimensions and other characteristics appeared. Warmth appeared quite stable among the majority of parents, but because of a minority subgroup with considerable instability, the mean stability of warmth was significantly lower than that for personality traits. For Warmth, the observed stability as well as the rates of stable or changed scores was not significantly different from those for either anxiety or depression.

The instability in Warmth was associated with low Warmth, less warm experience of childhood maternal parenting, and lower personality agreeableness and openness. However, instability in warmth was not associated to the level or the instability of anxiety or depression.

Protectiveness was systematically less stable than Warmth, although not significantly different on any single indicator. The stability level of protectiveness was moderate, at a level mostly below the stability of both anxiety and depression, although these differences were also not significant. Unstable Protectiveness scores were associated to a high level of Protectiveness, but not associated to any other characteristic included in Study II.

Authoritarianism was the least stable of all characteristics included in the study, significantly lower than personality traits, anxiety and depression, and the two other parenting dimensions. Only 29% of the parents did not change their Authoritarianism scores, 30% changed more than one standard deviation.

The use of true stability estimates, which is controlling for measurement errors, did not change the pattern of stability between the characteristics as portrayed by observed stability correlations and the rates of changed scores. However, this true stability estimation method produced wide confidence limits implying that a larger *N* would have been required to produce precise estimates.

The distribution of individual-level change gave valuable extra information by indicating excessive influence from sub-groups on the overall stability, and by describing the rates of small and large change. The distribution for Warmth, Protectiveness and Depression was split in that relatively few individuals (15-20%) showed intermediate stability whereas more individuals (20-25%) changed more than one standard deviation.

9.3 Parental longitudinal course in clinical services

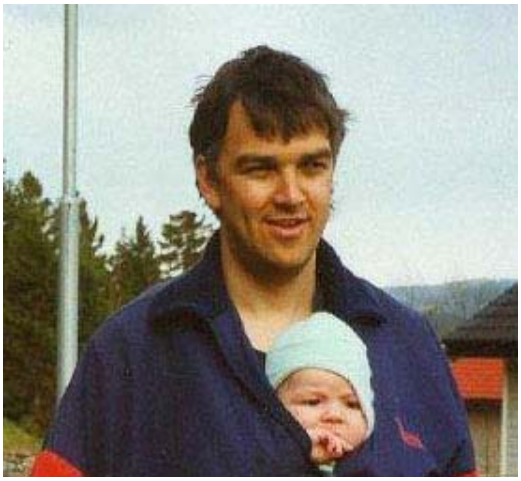
As expected when designing the study, the children referred to family clinics were characterized by a 1.8-year history of child psychiatry outpatient services before their referral, in addition to an initial period of 3.8-year period of service history in community services before referral to outpatient services. Furthermore, the referred children scored significantly higher than population expectations on all CBCL scales.

Parents referred to family inpatient clinics were followed for three months and twelve12 months after discharge from the clinic. At admission the level of anxiety and depression was significantly higher among mother, compared to community parents. This initially elevated level showed marked improvement from admission to the 3-month follow-

up, and this improvement was maintained at the 12-month follow-up. However, at the 3-month and 12-month follow-up maternal distress levels were still higher than for community parents. Improvements in maternal anxiety or depression were not depending on child diagnostic categories. Fathers did not show elevated anxiety or depression levels at any point.

Overall, clinic parents reported lower levels of parenting warmth at admission. However, levels and changes in parenting warmth from admission to follow-up did depend on child diagnostic category. At all points of assessment, parents of children with emotional problems showed levels of parenting warmth similar to the levels shown by community parents. Parents of children with learning/developmental disabilities or hyperkinetic disorder showed significant improvement in parenting warmth between admission and the 3-month follow-up. Other child diagnostic subgroups were too small to reach strong conclusions.

Parental depression and parenting warmth showed moderate negative associations both in terms of level and change. Parental anxiety was related to parenting protectiveness regarding both level and change. Furthermore, improvements in children's symptoms correlated with improved parental anxiety.



"Nordic kenguru?"; 1992

10. DISCUSSION

10.1 Main findings summarized

- Overall, anxiety but not depression was marginally lower among parents than among non-parents when all control-variables were included in the analyses. Regardless of parenthood, increased anxiety was found among single or previously divorced persons, and increased depression was found among those living alone.
- For the majority of community parents the self-reported parenting dimension of warmth towards their children was highly stable over nine months. Still, the overall group stability of parenting warmth was lower than that of parents' self-reported personality traits. This was due to a minority group of parents that reported less current parenting warmth, experience of less warm maternal parenting during childhood, and lower levels of personality agreeableness and openness. The parenting dimension of protectiveness was moderately stable, and high scores were generally more unstable. The parenting dimension of authoritarianism fluctuated the most, and only one third of parents reported stable levels of authoritarianism.
- At admission to inpatient family treatment in child psychiatry, mothers but not fathers, reported higher levels of anxiety and depression than community parents. Maternal anxiety and depression were significantly reduced at the 9- and 12-month follow-ups relative to their levels at admission. Both clinic fathers and mothers reported less parenting warmth than community parents at admission, except when their children had emotional problems. Parenting warmth was significantly improved for parents of children with attention, learning and developmental disorders at 9- and 12-month follow-ups relative to levels at admission, but not so for the parents of children with behavioral disorders. At 3-month and 12-month follow-up, overall levels of anxiety, depression and

parenting warmth among clinic parents were still significantly different from community parents. Parenting protectiveness was higher only in parents of children who had emotional problems, but did not change. Authoritarianism was higher only when children had learning or attention disorders, and also did not change. Improvement in parental anxiety was associated with improvement in their children's problems, whereas improvement in parental depression was associated with increases in parenting warmth.

10.2 Anxiety and depression related to parenthood and partnership

The results of Study I indicated a marginally lower prevalence of anxiety but not depression in parents compared to non-parents in the population. Parenthood as such was not a primary risk factor for emotional distress. This implies that data on adults can be used for reference or standardization in studies of parents/parenthood and emotional distress. Among community parents in Norway, married and cohabiting person (unless previously divorced) represent the base-rate of emotional distress. A strong aspect of Study I was that systematic comparisons were made between equivalent groups of parents or non-parents and partnership status and history, and was controlled for gender, age, social class and education, avoiding confounding influence.

Other large-scale studies of depression and parenthood have suggested parenthood as a risk factor for depression. However, these studies have lacked equivalent comparison groups or balanced sampling, and are mainly from the US. A possible explanation for the differences between the results of Study I and previous research from the US might be that Norwegian society and family politics ensure better conditions for children and their parents, creating results somewhat unique to Norway. Concerning anxiety related to parenthood only one previous study have been found, using a retrospective lifetime perspective.

Study III showed that child problems can probably increase anxiety and depression among mothers, representing a subgroup influence on emotional distress. However, the broadness of the groups in Study I concealed subgroup and episodic influence on parents' emotional distress. Other examples of such episodic influences are; having the first child (Mitnick, Heyman, & Smith Slep, 2009; Nomaguchi & Milkie, 2003), divorce transitions (Dupre & Meadows, 2007; Willitts, Benzeval, & Stansfeld, 2004), child developmental stages (Putnick et al., 2010) and acute child illness (Hatcher et al., 1989). The cumulative effects in the population of such subgroup and temporary influences will be observed only in marginal differences that are of little significance to overall community health, and counterbalanced by positive experiences of parenthood. A study from Denmark using twins as controls illustrates the difference between long-term and temporary influence: being a parent was associated with higher life satisfaction in adults 25-45 years old, whereas ever having had children did not have an effect on life-satisfaction among those 50-70 years old (Kohler et al., 2005). Another recent study illustrates the differential effects of parenthood: four years after childbirth, 88.5% of parents showed stably high or strongly improved life satisfaction, whereas the remaining small group (11.5%) reported reduced life-satisfaction (Galatzer-Levy, Mazursky, Mancini, & Bonanno, 2011).

Study I indicated that an increased risk of anxiety and depression was associated with two factors: previous divorce and single status. This is consistent with findings of a large-scale study of American mothers (Afifi et al., 2006), concluding that in epidemiological research divorced and single mothers need to be separated from married mothers due to very different risk of mental health problems.

10.3 Parenting dimension stability

In Study II, the three parenting dimensions warmth, protectiveness and authoritarianism differed considerably in stability level and stability distribution. Parenting warmth was most stable, protectiveness less and authoritarianism least stable. The three dimensions also differed in which variables that were associated to their instability.

10.3.1 Parenting warmth stability

Warmth was highly stable for the majority of parents, but due to a remarkably unstable minor group, the overall stability of warmth was significantly lower than the stability of the parents' personality traits. Instability of warmth was associated with less warm current parenting, a less open and agreeable personality and less warm retrospective childhood maternal parenting.

These correlates of warmth instability may arise from personality disorders, social dysfunction or attachment problems. Indeed, a recent study connects borderline personality disorder to extreme oscillations in parenting strategies (Stepp, Whalen, Pilkonis, Hipwell, & Levine, 2011). These findings supplement earlier studies documenting the risk of inconsistent parenting (Dwairy, 2008, 2010a, 2010b; Patterson et al., 1989; Trumpeter, Watson, O'Leary, & Weathington, 2008).

10.3.2 Parenting protectiveness stability

The stability of protectiveness was moderate, highly protective parents were more unstable and a split distribution of stability indicated that the instability of protectiveness was a subgroup phenomenon (se discussion of split distributions later). Study II did not indicate further associations with instability of protectiveness, unlike parenting warmth. Thus, the determinants of unstable protectiveness are probably different from those producing instability for warmth. Other studies of protectiveness stability related to children in this age-

group are not known. It should be noted that in the clinic sample of Study III, both the level and change of parenting protectiveness and parental anxiety were related between the two characteristics. This could indicate that the association between anxiety and protectiveness depends on the presence of child problems hypothetically eliciting both worries and protectiveness from their parents.

10.3.3 Parenting authoritarianism stability

The instability of authoritarianism was pronounced. This could in part be a result of the low internal consistency of the scale. However, the estimated true stability (compensating for measurement error) was almost as low as the observed stability of the Authoritarianism scale in Study III. The estimated true stability of Authoritarianism was closer to the estimated true stability of depression but was still lowest among the studied characteristics. The low consistency and instability observed could also be a consequence of the current parenting perspective in Study II, because retrospective versions of the questionnaire have been shown to have much higher internal consistency (Lizardi & Klein, 2002).

10.3.4 Distribution of individual stability

The stability results of parental depression and parenting warmth and protectiveness revealed associations between dysfunction and instability (e.g. low and unstable warmth). All three parental characteristics also revealed a strikingly similar split distribution of their stability, featuring few individuals with intermediate stability. What is previously known about the stability of depression as a clinical and epidemiological phenomenon is that stable non-depressed individuals constitute the majority of the population. In contrast to this majority, most vulnerable subgroups show fluctuations and recurrences of depression rather than stable dysfunction (Lovibond, 1998). Thus, there is a known subgroup association between being depressed and instability of depression.

This supports the interpretation for parenting warmth and protectiveness that the split distribution of stability and the dysfunction-instability associations indicate that unstable minor subgroups were the origins of the instability for these characteristics. These subgroups probably have characteristics differentiating them from the majority. However, specific indications of what characterizes unstable parents were only found for parenting warmth in Study II. Further research is needed on the specific determinants of instability for each parenting dimension.

10.4 The Parental Bonding Instrument and parenting dimensions

The validity of the PBI and especially the Authoritarianism scale as a measure of dysfunctional parenting is questionable for several reasons. The PBI has also suffered from a lack of conceptual clarity and differentiation between the unique qualities of the dimensions, except for the Warmth scale.

10.4.1 Parenting warmth - validity

The majority of items remaining in the PBI Warmth and Authoritarianism scale (see Table 3) after the revision by Kendler et al. (1996) are positively formulated, whereas several negatively formulated items were dropped. These positive scale items are not consistent with the original intention of making an instrument to measure dysfunctional parenting. The positive Warmth items are hardly sensitive in tapping active rejection or harsh/abusive parenting, as was also noted by Parker (1997) as a general weakness of the PBI twenty years after developing it.

The warmth dimension has been described by others with quite emotional words; "warmth," "nurturance," "care," "loving," "positive," "affection," and "acceptance" (Kendler, 1996). These aspects of parenting are probably primary parental contributions to building and

maintaining a good parent-child relationships and attachment bonds (Ainsworth, 1989), and therefore probably vital for normal development, and the lack of warmth a potential risk for problem development, especially for vulnerable children (Serbin & Karp, 2004).

Darling (1993) suggested that warm or detached parenting styles have the potential to act as defining contexts for other more behavioral and less stable aspects of parenting as e.g. protectiveness and authoritarianism. Bartholomew and Horowitz (1991) saw the determination of control or dominance aspects of parenting as more complex than the determination of warmth and affection, and referred to a study showing that love-hostility was highly stable across the years of childhood in contrast to the autonomy-control dimension (Schaefer & Bayley, 1960). These perspectives and results are consistent with Study II showing high stability for parenting warmth, a suitable quality for a "predictable defining context of parenting behaviors".

10.4.2 Parenting authoritarianism – validity and reliability

For the Authoritarianism scale, Study II indicated difficulties with reliability, and validity can be questioned. Despite excellent statistical scale unidimensionality, moderate mean inter-item correlations, and well clustered item contents, the internal consistency *alpha* was low and instability widespread. The psychometric properties of authoritarianism instruments can be expected to vary between countries and ethnic groups due to cultural influence (Dwairy et al., 2006; Kendler et al., 1997). Authoritarianism as such has been devalued in contemporary Norwegian culture (Tulviste, 2004). Thus, authoritarian strategies in parenting may be either underreported, used more inconsistently or be used as a result of perceived situational necessity rather than as a consistent parenting style. Low frequency and prevalence of parents' authoritarian behavior could undermine the internal consistency of the scale, especially in the shorter time-perspective of current parenting.

According to Dwairy (2006), authoritarian parenting should be considered more dysfunctional in Western countries, where a lower prevalence is documented. However, inconsistent authoritarianism is pathogenic in both Arab and Western cultures (Dwairy et al., 2006). Consequently, only a minority of parents could be expected to be dysfunctional in the non-clinical sample of Study II. Therefore, the widespread instability of the Authoritarianism scale found in Study II was not compatible with assuming that it is reflecting dysfunctional parenting.

Table 3. Items content in the original Parental Bonding Instrument, showing which items were removed in the revision by Kendler et al. (1996)

Parental Bonding Instrument (original retrospective version) (Parker et al., 1979)		
Warmth items	**Protectiveness items**	**Authoritarianism items**
Spoke to me in a warm and friendly voice	Did not want me to grow up	Liked me to make my own decisions
Appeared to understand my problems and worries	Tried to control everything I did	Let me decide things for myself
Enjoyed talking things over with me	Tended to baby me	Gave me as much freedom as I wanted
Frequently smiled at me	Tried to make me feel dependent of her/him	Let me dress in any way I pleased
Could make me feel better when I was upset	Was overprotective of me	
Did not talk with me very much		
Seemed emotionally cold to me		
Items removed by Kendler et al. (1996)		
Was affectionate to me	Did not help me as much as I needed	Let me do those things I liked doing
Made me feel I wasn't wanted	Felt I could not look after myself unless she/he was around	Invaded my privacy
	Did not praise me	Did not seem to understand what I needed or wanted
		Let me go out as often as I wanted

10.4.3 Differentiation between protectiveness and authoritarianism

In contrast to warmth, the differences between the concepts of protectiveness and authoritarianism have been less than clear, although both are related to regulation of child behavior, and are more determined by child and cultural factors than warmth appear to be (Kendler et al., 1997). Kendler (1996) did not address the conceptual or content validity when extracting the scales.

On a cognitive level both dimensions tend to focus on the inadequacy of the child's expected capacity to evaluate and regulate his/her own behavior. Overprotection has attracted interest as a potential risk factor for child anxiety, and authoritarian parenting has been focused as a risk for behavioral problems (O'Connor, 2002).

Comparisons with primates may offer some clarification of the core aspects of human protectiveness and authoritarianism (Bard, 2002). Primate and human protection of offspring is related to physical or deadly threats of predators and other environmental dangers, using retrieval and restriction of offspring as parenting strategies (Hahn-Holbrook, Holbrook, & Haselton, 2011). The protection of offspring profits from attachment based mutual proximity-seeking (Bard, 2002). Offspring protection is typically exaggerated by anxious or traumatized mothers; leading to less involved/attached and more distressed children/offspring (Kaitz & Maytal, 2005; Maestripieri, 2003). Authoritarian aspects of ordinary animal parenting are characterized by parenting dominance (Smither, 1993), gaining social subordination of offspring to the group, preventing the social costs of disapproval and social aggression versus acceptance and social position. Thus authoritarian parenting could serve to moderate unacceptable behavior in family and group relationships, but also stimulate self-assertion and dominance competence among the stronger offsprings (Maestripieri, 2003).

These primate analogies point to protection and dominance as central concepts from a primate perspective. Despite that the animal analogies do not match well the concrete item

content of the ‘Protectiveness’ and ‘Authoritarianism’ scales, the item content does match the concepts of protection and dominance as alternative scale names.

10.4.4 Parental Bonding Instrument - validity

Considering the above-mentioned weaknesses, the interpretations of results based on the PBI, especially the Authoritarianism scale, must be treated with caution when portrayed as a valid and reliable measurement of dysfunctional parenting.

Without questioning all the research done with the PBI, one could argue that the PBI scales are more capable of describing variation in normal parenting, than to capture dysfunctional parenting. One could suggest that they measure quite well the dimensions warmth-indifference, laxness-overprotection and freedom-dominance. However, if used to screen for dysfunctional parenting, the PBI would probably produce group selections with only moderate sensitivity and low specificity; conceivably identify some dysfunctional parents, but point out many parents that are actually not dysfunctional. However, the high acceptability of the positively formulated items of the Warmth and Authoritarianism scale could still be useful as a first stage of screening daily parenting.

10.5 Clinic parents – follow-up of inpatient family treatment

10.5.1 Anxiety and depression – level and change

The high anxiety and depression levels at admission among clinic mothers in Study III may in part reflect realistic worries about and sorrow over their struggling children, who all had serious and long-lasting problems. The considerable drop in parents’ anxiety and depression at both follow-ups in Study III was similar to a drop in anxiety observed within a short time-frame in a study from an acute pediatric reception (Hatcher et al., 1989). In both studies, improvement in anxiety was associated with child improvement.

However, even the follow-up levels of anxiety and depression in Study III implied more than double prevalence compared to anxiety and depression in the community. The follow-up levels of the clinic mothers were similar to anxiety and depression among mothers of children in long-term follow-up diabetes treatment (Horsch et al., 2007) and maternal anxiety in a pediatric reception (Hatcher et al., 1989), both showing the same doubled prevalence. Furthermore, there was a doubled risk of depression among mothers of children with intellectual disabilities and autism (Olsson & Hwang, 2001) and doubled risk of both anxiety and depression among parents in child psychiatry outpatient clinics (Rimehaug, Berg-Nielsen, & Wallander, Unpublished manuscript).

10.5.2 Parenting dimensions – level and change

Parents of children with learning/developmental and attention disorders showed the largest improvement in parenting warmth at the 3-month follow-up in Study III. Conceivably, improved parental understanding of and coping with their child's problem behavior during treatment may have reduced concerns and daily strains in the aftermath, contributing to improved parenting warmth. This interpretation is not incompatible with the lack of association between child improvement and increased warmth because such parental changes do not depend on child improvement, and because these are chronic conditions for which the most realistic expectations are long-term moderate improvements.

Retrospective studies based on adult offspring reports have established that adults with emotional problems especially tend to report high childhood protectiveness (Balon, 2001; Gladstone & Parker, 2005) and low warmth Balon et al. (2001). Thus, the Study III self-reports of current parenting normal levels of warmth and low levels of protectiveness among parents of children with emotional problems can be considered atypical and not quite consistent with previous retrospective research. The children in Study III were however not an

untreated sample at admission, but had more than five years average treatment history in community and child psychiatric services. Thus, the extensive guidance, assessment and treatment already received in this sample may have been more beneficial for parental warmth among parents of children with emotional problems than those trying to cope with behavioral problems. Children with behavioral problem most likely elicit more parenting stress (Gowers & Bryan, 2005; Solem, 2011) and can therefore be more difficult to help to a better parent-child relationship than children with emotional problems. The same assumption may conceivably apply to children with undetected attention, learning and developmental problems.

However, the findings from study III cannot substantiate an interpretation based on treatment received prior to the study. A selection bias due to referral processes or a selectively increase of social desirability responding in this group are also possible interpretations for the atypical level of warmth related to children with emotional problems.

10.5.3 Clinic parents and their children

The parent groups that reported improved parenting warmth and reduced anxiety and depression at the follow-ups still displayed levels significantly different from community parents.

Aspects of parenting are most likely not a primary cause of learning/developmental and attention disorders, but they may still have had an influence on development of secondary child problems, such as conduct and emotional problems, as well as the functional impairment related to the primary problems (Deault, 2010; Patterson & Fisher, 2002). Thus, it cannot be excluded that lower warmth may in part have preceded and contributed to child problems. In general parents may develop emotional distress and a less warm relationship to their children without the children having any psychiatric problems. Parents personality traits, mental health

problems and attachment insecurity (Belsky & Jaffee, 2006; O'Connor, 2002), or stressful and discouraging circumstances may have contributed to distress and low parenting warmth representing a long-term increased risk for pathogenic parenting practices (Gladstone & Parker, 2005; O'Connor, 2002).

Despite these interpretations, it is most likely that low warmth for many of these parents has developed because of the long-term burden of caring for psychiatrically impaired children. Many children in psychiatric treatment have severe, chronic or recurring problems, especially the sample in the Study III with more than five years of problem history. More than half of the sample had attention, learning and developmental disorders, that are chronic child conditions where the realistic expectations are only gradual and moderate improvements happening over time.

Parenting burdens probably still carry on despite treatment that, if successful, could ameliorate primary child problems and reduce secondary problems (Rimehaug, Unpublished manuscript). Therefore the follow-up results are the reports of parents probably still struggling with children with severe mental health problems, which conceivably may still have an impact on the parents' emotional distress as well as parenting warmth. Therefore, the remaining low warmth at follow-up can still be caused by burdening parenting challenges.

10.5.4 Clinical implications

It should be noted that the inpatient child psychiatric family treatment program did not target parental anxiety and depression directly, but did focus on parent-child interaction in addition to child problems. A treatment effect was thus not unlikely, but investigating this was not the purpose of Study III. Such an effect cannot be substantiated in a longitudinal design without a control group. Furthermore, the treatment program was neither manualized, nor especially well systematized; hence it represented a typical naturalistic clinical setting.

In Study III, the prevalence of symptoms of anxiety and depression was striking among mothers upon admission at the clinics, and the extent of low parenting warmth was worrying. Regardless of the reasons behind parents' anxiety and depression and low warmth at admission, these characteristics might affect present as well as future child outcomes. Parents' anxiety and depression may also influence the validity of their reports of child problems (Berg-Nielsen, Vikan, & Dahl, 2003), moderate treatment prognosis (Reyno & McGrath, 2006) and contribute to future parenting problems (Israel, Thomsen, Langeveld, & Stormark, 2007b; Kazdin et al., 1993; Rutherford, 2004). Good parenting and positive parent-child relationship are known to be important contributors to resilient outcomes for children who are exposed to a wide range of adversities and risks (Luthar & Cicchetti, 2000; Masten, 2001). A warm relationship is also known to increase treatment prognosis (Scott & Dadds, 2009). Thus, assessing and helping parents with low parenting warmth or anxiety and depression could prevent further problem development and support child and parent treatment intervention outcome (Reyno & McGrath, 2006; Scott & Dadds, 2009).

Yet, parenting and parents' mental health are not systematically addressed by assessment procedures or targeted by treatment components in most Norwegian child psychiatric clinics today. Parents' emotional distress far below thresholds for a diagnosed disorder may have significant impact on family interaction and have prognostic consequences for the children (Fite, Stoppelbein, & Greening, 2008; Solem, 2011), but only previously diagnosed disorders of parents receive some attention in the Norwegian child psychiatric clinics today, and structured assessment of parents' emotional distress and their parenting is not routine practice. Norwegian national guidelines for child psychiatric clinics do not suggest any systematic evaluation of parents (Helsedirektoratet, 2008; Novik & Lea, 2010). In addition, some child psychiatric clinicians express reluctance to target emotional or

behavioral problems of the parents, in fear of compromising the necessary treatment alliance with the parents.

The possibility that child problems can burden parents should supplement the traditional perspective that parent-child relationships and parental mental health are pathogenic factors for child mental health. However, both perspectives should motivate a stronger focus on parents and parenting as prognostic factors in child psychiatry.

10.6 Parenthood, parenting, anxiety and depression: causal direction?

The observed associations between anxiety/depression and being single or divorced in Study I, and between parent's anxiety/depression, parenting and child mental health problems in Study III must be interpreted cautiously because the direction of causality is not clear. In Study I the associations may reflect either a protective effect of being in a relationship, the detrimental effect of divorce, or selection effects of anxiety and depression; i.e. an altered chance for relationship establishment or breakdown because of mental health problems. In Study III, pathogenic influence of parent's mental health and parenting practices on children can cause the associations, or child problems leading to parent-child relationship problems, altered parenting behavior and emotional distress. Anxiety and depression resulting in altered chances of becoming or remaining a parent can also be an underlying process in both studies.

These processes may well be bi-directional, but few studies have tested the causal direction. Some studies have supplied indirect indications that depression does not affect the chance of first marriage or cohabitation (Lamb, Lee, & DeMaris, 2003), but increased the chance of divorce (Wade & Cairney, 2000). A retrospective study found indications of different selection effects of anxiety and depression in interaction with early or late onset disorders related to marriage, parenthood and divorce (Turnbull et al., 1990), and depression

is known to increase the risk of losing custody (Blegen, Hummelvoll, & Severinsson, 2010). Future research should address the challenge of disentangling these bidirectional possibilities.

10.7 General strengths and limitations

The specific strengths and limitations of the samples and each instrument in addition to selected statistical challenges encountered in each study are discussed in other sub-sections of this thesis, in the Methods section and in the Discussion. The focus in this sub-section is therefore on general strengths and limitations.

The community sample was recruited at several randomly selected sites, and the clinic sample was recruited at three sites, reducing the potential danger of demonstrating only local or occasional unique results. The community samples in Study I and II were representative for the population in the area. However, the clinic sample of parents in Study III are not representative of parents of mentally ill children in the general population, but rather represent parents of chronic cases encountered in clinical settings in this specific area. Thus, wide generalizations cannot be made from the clinic sample because the subpopulations are highly selected by naturalistic processes and service arrangements that vary greatly between countries, between sites and over time.

The diagnostic information in Study III was also a weakness. The differentiation of parents according to child diagnostic groups was not initially planned in the design of Study III. This resulted in clinical and not research diagnoses with non-optimal reliability and validity, and a considerable rate of lacking diagnostic evaluations. The naturalistic design in Study III led to an unbalanced distribution of children among diagnostic categories, and led to major challenges in analyzing and interpreting the results of parents who were grouped according to their children's diagnoses.

The primary weakness of this thesis is that the studies were almost exclusively based on self-reports and questionnaires. Using multiple informants or observational approaches could have improved the accuracy and validity of the results and conclusions.

10.8 Conclusions and suggestions: research and clinical implications

The results in Study I showed that parenthood itself does not imply any mental health risk, so adults can be used for reference or standardization regarding parental mental health. Still the subgroup strains of parenting mentally ill children can represent a risk for their parents as indicated by Study II, as can temporary strains in a decades-long career as parent. These specific risks should not be mistaken as parenthood in general. Parenthood demographic groups can easily be confounded in research with previous divorce and single status, as seen in Study I.

The most important finding in this thesis from a theoretical view-point was the documentation in Study II and III of the marked differences between the parenting dimensions. This was observed in the diverging stability levels and different stability distributions among community parents in Study II. It was also observed in the differential distribution and change of each parenting dimension relative to mother and fathers and to child diagnostic subgroups in Study III. In these results parenting does not appear as a unitary function, rather in the form of specific dimensions or behaviors that must be separated to understand their unique qualities, including what determines them and how they influence child development.

The diverging stability of the parenting dimensions documented in Study II is consistent with the suggested significance of warmth as a stable defining context for more behavior-oriented and less stable parenting behaviors (Bartholomew & Horowitz, 1991). This

perspective should motivate more specific investigations of how the interactions between parenting dimensions and behaviors determine their impact on child development (Deater-Deckard et al., 2006)

The subgroups with combined unstable and dysfunctional parenting indicated in Study II should be followed in further research because instability in parenting is probably a quite pathogenic aspect of parenting (Dwairy, 2010a, 2010b). The association between parent psychopathology and inconsistent parenting should be investigated, together with inconsistency as a primary characteristic of parenting or as a supplementary quality of any parenting dimension or behavior. An increased focus on inconsistency is also important in clinical practice. There is a danger of overlooking inconsistency in parenting in clinical practice as well as in research unless parenting is evaluated across time or with methods developed specifically to reveal inconsistency.

The observed associations between anxiety/depression, parenthood, parenting and relationship history must be interpreted cautiously because the directions of causality are not clear. Future research should address the challenge of disentangling the bidirectional processes between these factors, including selection processes that may affect transitions of group memberships.

Study III showed that considerable subgroups of clinic parents in child psychiatry may suffer from anxiety, depression or impaired parenting warmth. As a first step, systematic evaluation of parenting, parental emotional distress must be implemented to ensure their detection. Today such routines are inadequately developed in contemporary Norwegian child psychiatry. Thus, the necessary basis is not sufficiently present for the next required step: implementing effective treatment components specifically addressing parenting warmth and emotional distress that may improve the prognosis for their children as well as for the parents.

“Sibling care and protection”; 1998

12. REFERENCES

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Study I

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ORIGINAL PAPER

Anxiety and depressive symptoms related to parenthood in a large Norwegian community sample: the HUNT2 study

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Abstract
Introduction The study compared anxiety and depression prevalence between parents and non-parents in a society with family- and parenthood-friendly social politics, controlling for family status and family history, age, gender, education and social class.
Methods All participants aged 30–49 ($N = 24{,}040$) in the large, non-sampled Norwegian HUNT2 community health study completed the Hospital Anxiety and Depression Scales.
Results The slightly elevated anxiety and depression among non-parents compared to parents in the complete sample was not confirmed as statistically significant within any subgroups. Married parents and (previously unmarried) cohabiting parents did not differ in portraying low anxiety and depression prevalence. Anxiety was associated with single parenthood, living alone or being divorced, while elevated depression was found only among those living alone.
Discussion Burdening selection and cultural/political context are suggested as interpretative perspectives on the contextual and personal influences on the complex relationship between parenthood and mental health.

Keywords Single parents · HADS · Cohabitation · Divorce · Selection

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Introduction

Despite the central importance of parenthood as a social role, studies of its possible associations with mental health have produced inconsistent results. An early review from 1987 [29] suggested increasingly negative impact on psychological well-being from parenthood, while a review in 1990 [35] reported positive as well as negative effects of parenthood, both reviews reporting considerable differences across studies and between subgroups of parents. These earlier reviews as well as more recent research suggest that the associations between parenthood and mental health are complex, depending on the interplay of multiple individual, familial and contextual factors, and are also influenced by society and culture, possibly affecting subgroups differentially. However, the research on parenting is dominated by North American studies restricting the variation in factors influenced by society. The only large-scale study we have found analysing multiple factors and parent groups is from the US [12]. Therefore, the present study from Norway represents an important expansion of the knowledge base.

The large-scale ($N > 13{,}000$) study from the US by Evenson and Simon [12] explored multiple parent and family constellations, contrasted parents with non-parents, and included both sexes. This publication found not only larger variation, but also an average elevated level of depression among all parent groups—especially non-custodial parents. However, the study did not address other aspects of mental health than depression and had active oversampling of multiple disadvantaged groups. Other studies from the US National Survey of Families and Households (NSFH) have shown parental depression to vary with contextual factors such as ethnicity [21], single parenthood [9] and divorce among men [22], and when

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focusing specifically on the passage into parenthood, change in depression depends on gender and relationship history [34].

Most prior studies have addressed general well-being or distress, reported on only depression as a mental health indicator, or did not report actual symptom levels or prevalence of clinically relevant elevations. These deficiencies have made it difficult to evaluate the public health importance. Contributing to the lack of clarity is that many previous studies have been small, limited in scope, or date back several decades. Moreover, methodological limitations include lacking vital comparison groups of non-parents [13], single or cohabiting persons [9], or even fathers [41], or ignoring prior marital history as a factor [4]. Also defining parenthood mainly as a biological state in contrast to a social role, or focus specifically on the passage into parenthood can confuse important subgroups of parents (e.g. empty-nested, non-custodial/non-resident, new/experienced parents and step parents). Similarly, single parents are rarely differentiated into those who are truly a single parent versus those who are cohabiting. Even a relatively large ($N > 5{,}000$) Canadian study showing more psychological distress and alcohol consumption among single parents compared to couples controlled only for gender and age [3], lacking cohabitation and marital history as differentiation factors. The present study was designed to address several of these deficiencies, while concentrating on parenthood as a social role.

Research restricted geographically to North America has been less able to illuminate the possible impact of differences of the socio-political context and cultural norms relevant to parenthood. A recent report on public investments in children and families ranks Norway in the top group of 21 OECD countries (e.g. for % of gross domestic product, % of public spending, US$ spent per child in the population, % increase in these investments from 1980 to 2000). In contrast, US was ranked towards the bottom on all indicators, and has showed a worsening historical trend [15]. In Norway, 54% of all babies have unmarried parents, but this breaks out to 42% cohabiting parents and only 11% single mothers [38]. In the US, 37% of all births are to unmarried parents [32], but official statistics do not differentiate cohabiting from single mothers. The overall parental cohabitation rate is 8.2% in the US [2] in contrast to 24.5% in Norway. In both countries, single parenthood is still associated with poorer health, less education, and lower income, but this is more pronounced in the US. These differences may influence parental mental health, enabling the present study from Norway to shed some light on the influence of contextual and cultural factors on the associations between parenthood and mental health.

Based on prior studies, we suggest that the mental health consequences of parenthood are largely dependent on interactions with contextual factors, which can easily be confused with personal history and selection effects. Our aim with this study is to utilize data from a large community health survey to examine multiple subgroups of parents and non-parents of both sexes. Because prevalence differences in anxiety and depression have been documented in connection with gender [16], age [30], education, and marital status [40], it was important to control for the separate influences from and possible interactions with these status characteristics. Our hypothesis is that parenthood is indirectly associated with mental health depending on contextual factors and personal history, and will appear somewhat more positively when investigating a population where cultural and socio-political factors are more family- and parenthood friendly than in the US.

Methods

Subjects

The Nord-Trøndelag Health Study (HUNT2) is a non-sampled data collection from a substantial majority of the total adult population 20–100 years old in all municipalities in the Nord-Trøndelag county of Norway [19]. The area has a highly stable population including coastal, inland rural areas and several small towns. The ethnicity of this population is highly homogeneous, including only a very small element of non-western immigrant (<1%) [11] as well as indigenous people (<1%) [37]. Of the 92,100 invited by mail, 65,648 (71% of the population) participated and 59,930 (65%) completed a health survey including the mental health questionnaire used in this study [19]. Thus, there is no bias from a sampling procedure, but there was a non-random drop-out rate of 29%. Among non-responders, 13% were unwilling to participate in the study, 21% forgot to complete the instrument, and 66% were practically impeded from doing so [20].

The present study restricted the age-span 30–49 years to reduce ambiguity of parenthood. Including the age-span 20–30 would have added few parents and included many future parents as non-parents. Including adults older than 50 years would have polluted the non-parents group with many "empty-nested" former parents due to our parenthood definition (see below). The exact age cutpoints were kept at 30–49 years of age to enable comparison with other publications from HUNT2 and with public statistics. Exclusion of those with partially missing data and ambiguous parenthood information reduced the response rate from 72 to 70%. The final sample of $N = 24{,}040$ aged 30–49 included 75% of all "active" parents in HUNT2: 65% of the women and 56% of the men were parents.

Measures

Here, the concepts of anxiety and depression are used to denote the presence of clinical symptoms above a defined cutpoint, not as the presence of an anxiety or depressive disorder. The Hospital Anxiety and Depression Scale (HADS) [36] contains two symptom scales with seven items rated on four-point scales each for anxiety and depression. The two scales show good internal consistency and a stable two-factor structure in numerous studies [6, 28] as well as in the HUNT2 study (consistency $\alpha = 0.78$ for anxiety and $\alpha = 0.80$ for depression). The two HADS scales have reasonable sensitivity and specificity, which has averaged 0.80 across multiple studies in identifying unspecified anxiety or depressive disorders [6], using a score of 8 or above as cutpoint for each scale, also used in validation studies and in surveys in clinical populations [18, 36]. The anxiety scale mainly focuses on the restlessness-tension and worry-panic dimensions of anxiety (e.g. A/1 "I feel tense and wound up"). The depression scale mainly focuses on anhedonia, a main feature of depressive states (e.g. D/10 "I have lost interest in my appearance") [18]. The validity of HADS has been satisfactory in numerous analyses [6, 18, 31]. Across ages 18–65, population prevalence estimates in HUNT2 are 9.2% for depression and 15.6% for anxiety, compared to 5.3 versus 11.1% depressive disorders and 10.5 versus 15.5% anxiety disorders in other rural versus urban Norwegian areas [24].

Parenthood was defined by social criteria, inferred from marital status, age, and household composition information because direct parenthood information was not available in the HUNT2 database. Erring on the side of over-exclusion when information on relationship status was ambiguous resulted in 362 adults residing with children being excluded when other information suggested they were not likely a parent. A combined family status variable was constructed, incorporating information on current partnership (single, married, cohabiting), marital history (divorced, widowed, unmarried) and parenthood (parent or not) into 14 known categories (marital history could not be differentiated for those married). The categories are listed in the first column of Table 2. Education level was expressed in years, and social class coded on the basis of occupation [25].

Statistics

For continuous variables, Pearson product moment coefficients were used to examine relationships between variables, and differences between group means were analysed using ANOVA. Differences in anxiety or depression prevalence were analysed with χ^2 or with odds ratios (OR) in logistic regression. Due to multicolinearity, the ordinary logistic regression approach (entering parenthood, current partnership, and divorce as separate factors into regression models) resulted in unstable models and possible Type II errors, especially if allowing for interaction effects. To avoid this problem, the combined family status variable was used for multiple simple comparisons between subgroups in logistic regressions, using "married parent" as a common reference group or by selecting a pair of subgroups only for a specific comparison. In all logistic regressions, age, gender, education level and social class were included in models as control variables; however, excluding them did not alter the statistical significance of any of the reported differences.

Because of the large number of subjects ($N = 24{,}040$) and accordingly high statistical power, a minimum level of $p < 0.005$ was used to indicate statistical significance in analyses. The relative importance of significant results was evaluated using prevalence rates and effect size by means of OR for logistic regression analyses. All results based on dichotomous HADS variables as dependent variables (DVs) were compared with those from equivalent analyses on continuous HADS scores as DVs. Because these results were highly similar, only the analyses on dichotomous variables are reported herein.

The Nord-Trøndelag Health Study was approved by the National Data Inspectorate and the Board of Research Ethics in Health Region IV of Norway.

Results

Descriptive statistics on anxiety and depression overall and for subgroups are presented in Table 1. There was a strong positive correlation between anxiety and depression symptom scores for the total sample, $r = 0.61$, $p < 0.001$. Likewise, there was an association between clinical levels of anxiety and depressive symptoms, $\chi^2(1) = 3967$, $p < 0.001$, such that 16.2 and 8.4% of all participants reported clinical levels of anxiety and depression symptoms, respectively, and 5.5% reported both. Social class and education level initially appeared to be associated with the probability of being married versus cohabiting, but when controlling for age, these associations disappeared.

Marital history, which was only available for those presently not married ($N = 8{,}332$), was unevenly distributed. Only 2% ($n = 182$) were widowed. Among those presently not married, 26% of cohabiting persons were divorced compared to the significantly higher 33% among single persons ($\chi^2(1) = 42.53$, $p < 0.001$). Of single parents, 57% were divorced versus 26% of single non-parents (contrast $\chi^2(1) = 297.6$, $p < 0.001$). Finally, 23% of cohabiting parents were divorced versus 38% of cohabiting non-parents (contrast $\chi^2(1) = 82.10$, $p < 0.001$). These

Table 1 Descriptive statistics for anxiety and depression for parents and non-parents by partnership and gender

	N	Anxiety		Depressiveness	
		Cut-off prevalence (%)	Scale, *M* (SD)	Cut-off prevalence (%)	Scale, *M* (SD)
Women					
Married					
Non-parents	2,777	18.0	4.6 (3.4)	7.8	3.1 (2.8)
Parents	5,883	15.8	4.4 (3.3)	7.3	2.8 (2.8)
Cohabiting					
Non-parents	417	24.5	5.0 (3.6)	7.7	3.1 (2.8)
Parents	1,587	18.0	4.5 (3.4)	8.3	3.0 (2.9)
Single					
Non-parents	1,197	23.7	5.0 (3.9)	10.6	3.3 (3.2)
Parents	724	27.6	5.5 (4.0)	12.4	3.4 (3.3)
Men					
Married					
Non-parents	2,343	12.8	4.0 (3.1)	8.1	3.3 (2.9)
Parents	4,705	12.3	4.0 (3.0)	7.8	3.2 (2.8)
Cohabiting					
Non-parents	517	15.7	4.2 (3.3)	7.7	3.1 (2.8)
Parents	1,493	13.7	4.2 (3.0)	6.8	3.1 (2.7)
Single					
Non-parents	2,202	17.8	4.6 (3.6)	12.4	3.7 (3.3)
Parents	195	23.6	5.4 (3.6)	14.4	3.9 (3.4)

differences identify mild multicolinearity among grouping variables. In addition, the association between having a partner (married or cohabiting) and being a parent ($\chi^2(1) = 3423$, $p < 0.001$) represented a moderate colinearity, but there is no general association between divorce and parenthood.

Simple comparison between parents and non-parents revealed non-parents to have higher prevalence of anxiety (18 vs. 15%, $\chi^2(1) = 20.64$, $p < 0.001$) as well as depression (9 vs. 8%, $\chi^2(1) = 14.43$, $p < 0.001$). When controlling for education, social class, age and gender, the difference in anxiety was still significant, but not the difference in depression.

Anxiety regressed on combined family status variables

To test thoroughly whether parenthood was associated with differences in anxiety, the parents were contrasted to equivalent non-parents within each subgroup defined by partnership status and history. No statistically significant differences between parents and non-parents were found within the seven subgroup comparisons.

Then to clarify what did characterize persons with elevated anxiety, we compared all other family status subgroups to "married parents" as the reference group. The resulting logistic regression statistics are shown in Table 2, and Fig. 1 illustrates anxiety prevalence for most of the combined family status subgroups (the four subgroups involving widowed persons are not shown in Fig. 1 because of small $n <= 70$).

The results in Table 2 suggested "divorced" or "single and never married" as the common characteristics of groups with elevated anxiety (plus the small group of widowed single parents). To elaborate the influence of divorce, the "divorced" subgroups were contrasted to the equivalent "never married" subgroup (first among cohabiters only, then among single persons only): Those "divorced and cohabiting" had significantly higher anxiety prevalence than those "never married and cohabiting" [B (SE) = 0.33 (0.09), OR = 1.38, $p = 0.001$], and those "divorced and single" had higher anxiety prevalence than those "never married and single" [B (SE) = 0.43 (0.08), OR = 1.54, $p < 0.001$]. Further elaboration for the influence of being single, single groups were contrasted to their equivalent cohabiting subgroup. These analyses revealed an important nuance in that single status appeared to have influence on anxiety only in combination with parenthood. Single parents showed significantly higher anxiety prevalence than cohabiting parents [B (SE) = 0.55 (0.09), OR = 1.73, $p < 0.001$]; however, there was no difference between single and cohabiting non-parents, or between single parents and single non-parents. This interaction did not show itself clearly when single persons were first contrasted to married parents.

Table 2 Regression of anxiety and depression on family status categories

Marr Par (reference category for simple contrasts)	Clinical level of anxiety			Clinical level of depression		
	B (SE)	OR	95% CI	*B* (SE)	OR	95% CI
Marr NoPar	0.04 (0.05)	ns		−0.17 (0.07)	ns	
Um Coh NoPar	0.26 (0.12)	ns		−0.17 (0.18)	ns	
Um Coh Par	0.06 (0.07)	ns		0.09 (0.09)	ns	
UmSing NoPar	0.31 (0.06)	1.36**	1.21–1.54	0.42 (0.08)	1.52**	1.31–1.78
Um Sing Par	0.53 (0.13)	1.70**	1.32–2.18	0.73 (0.16)	2.07**	1.51–2.85
Wi Coh NoPar	0.15 (0.50)	ns		−0.31 (0.74)	ns	
Wi Coh Par	0.28 (0.46)	ns		0.14 (0.61)	ns	
Wi Sing NoPar	0.23 (0.34)	ns		−0.06 (0.40)	ns	
Wi Sing Par	0.87 (0.29)	2.39**	1.35–4.24	0.29 (0.44)	ns	
Div Coh NoPar	0.56 (0.13)	1.74**	1.35–2.25	0.08 (0.18)	ns	
Div Coh Par	0.37 (0.10)	1.44**	1.19–1.75	0.17 (0.14)	ns	
Div Sing NoPar	0.75 (0.08)	2.12**	1.80–2.49	0.54 (0.10)	1.72**	1.40–2.10
Div Sing Par	0.83 (0.10)	2.29**	1.87–2.80	0.59 (0.14)	1.80**	1.37–2.37
Constant	−1.88 (0.18)	0.15**		−3.47 (0.24)	0.31**	

The control variables such as age, gender, education and social class are not displayed in this table

Marr married, *Um* unmarried, *Wi* widowed, *Div* divorced, *Coh* cohabiting, *Sing* single, *Par* parent, *NoPar* non-parent

**$p < 0.005$

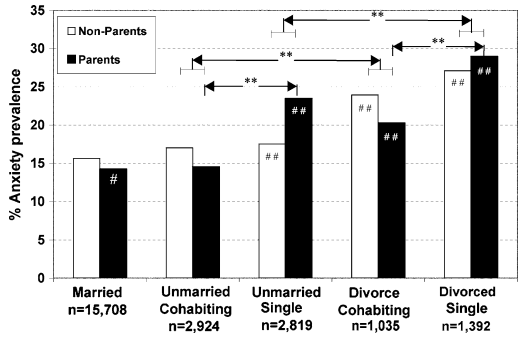

Fig. 1 Anxiety prevalence for selected family status subgroups. # Reference group, significant OR comparison to reference group (married parents) ##$p < 0.005$, significant OR contrasts **$p < 0.005$

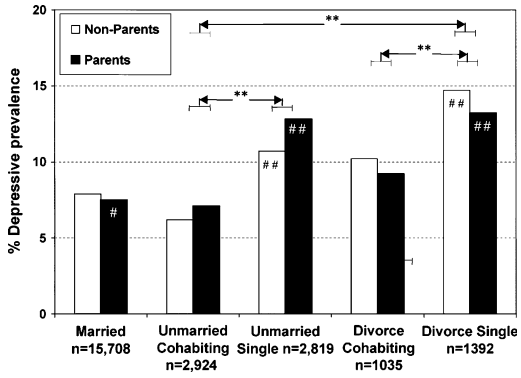

Fig. 2 Depression prevalence for selected family status subgroups. # Reference group, significant OR comparison to reference group (married parents) ##$p < 0.005$, significant OR contrasts **$p < 0.005$

The control variables gender [female = 1: B (SE) = 0.34 (0.04), OR = 1.40, $p < 0.005$], education level [B (SE) = −0.11 (0.02), OR = 0.90, $p < 0.005$] and social class [B (SE) = −0.02 (0.01), OR = 0.98, $p < 0.05$] showed significant associations with anxiety, but age did not. Interactions between these control variables and other variables were not significant.

Depression regressed on combined family status variables

To test thoroughly whether parenthood was associated with differences in depression prevalence, parents were compared to equivalent non-parents within each subgroup defined by partnership status and history. No statistically significant differences between parents and non-parents were found in the seven possible comparisons.

The preliminary impression when inspecting Fig. 2 was that subgroups with elevated depression prevalence were characterized by single persons, possibly with higher prevalence if divorced. However, statistical analyses did not quite confirm this: Contrasting all other family status subgroups with "married parents", as the reference group showed that single status was the only common feature among subgroups with elevated depression (see Table 2).

Elaborating this with other contrasts confirmed this conclusion: Those "divorced and single" had significantly higher depression than "divorced cohabiters" [B (SE) = 0.42 (0.13), OR = 1.52, $p = 0.001$], and those "never married single" had higher depression prevalence than "never married cohabiters" [B (SE) = 0.43 (0.10), OR = 1.53, $p < 0.001$]. However, "divorced cohabiters" did not have significantly increased depression prevalence contrasted to any married or unmarried groups. This indicated that the single status was more important than the divorce history in relationship to depression.

The control variables education level [B (SE) = −0.16 (0.02), OR = 0.85, $p < 0.005$] and age [B (SE) = 0.04 (0.01), OR = 1.04, $p < 0.005$] had statistically significant associations with depression prevalence, but gender and social class did not. Interactions between these control variables and the other available variables were not significant.

Discussion

The results of this study support the perspective that the associations between parenthood and mental health are complex and highly dependent on contextual factors. It is theoretically interesting and in contrast to many previous US studies [12, 29] that the initial simple analysis indicated a lower prevalence of both anxiety and depressive symptoms among parents compared to non-parents. However, the differences are too small to have any public health significance. Moreover, further analysis showed that these parent/non-parent differences were in part confounding effects of relationship variables, and were also inconsistent across specific subgroups.

The majority groups of married parents and cohabiting parents without a prior divorce share the absolute base level of anxiety and depression prevalence with non-parents in the same subgroups. In contrast, the small subgroup of single parents showed only a moderate elevation in prevalence of anxiety if never married, but doubled anxiety prevalence if a divorce was part of their relationship history. However, these elevations were not significantly different from equivalent non-parents subgroups, suggesting that being a parent does not represent the risk associated with these subgroups. Depressive prevalence showed a somewhat similar picture with almost twice as high as prevalence among all single persons regardless of parenthood, also pointing towards other factors than parenthood in itself. Finally, the effects of social class and education were small in a population perspective, and did not influence the conclusions regarding parenthood or other family status characteristics. We will now address methodological issues, before we discuss interpretations.

Methodological issues

The broad epidemiological perspective of this study may conceal effects on mental health of specific parenting events (e.g. becoming a parent, births of additional children) as well as on the challenges associated with certain stages of parenting (e.g. caring for infants or adolescents). Based on the overall results, however, these events or stages do not seem to result in longer term effects on mental health, or else parents overall would report a reduced mental health. There may be transient effects, or these effects are relevant only to limited groups. Alternatively, such specific negative influences are outweighed by positive parenthood factors across time.

An advantage of the database utilized for the present study is that the recruitment methodology reduced the influence of sampling bias because the entire population of a geographical area was personally invited. The present study included parents with decades of caregiving experience as well as new parents and non-parents, differentiated gender and single as well as married and cohabiting persons, and allowed some differentiation based on prior marital history. At the same time, this database has limitations, in particular by not identifying non-custodial biological parents or adoptive or foster parents, or specifying prior marital history for those currently married. Neither can it identify "empty-nested" parents, which required the exclusion of age groups above 50, where the rate of "empty-nested" parents rises steeply. Because Norway is highly homogeneous, especially in the targeted geographic region, this study was also insensitive to factors associated with ethnicity or migration, which can be powerful contextual factors for parenthood in some populations.

The large statistical power in this study implies that statistical significance could be attained for minor effects when analysing the entire sample. On the other hand, important effects can become rejected as statistically non-significance because they are represented by small subgroups. This may be a particular problem for the small group of widowed persons in the present study. Using cut-off categorizations of anxiety and depression could have reduced the statistical sensitivity to differences in smaller subgroups, but analyses of continuous variables did not confirm this.

Coding parenthood based on combining family composition and age implies a danger of misclassifications into both parents and non-parents. The exclusion of persons below 30 and above 50 years of age and 362 individuals with ambiguous information reduced but did not rule out this weakness. If the survey database had included direct questions on parenthood, this limitation would have been removed.

Interpretations focused on relationship history and consequences

The traditional interpretation when finding a reduced mental health among single parents has been focused on the strains and disadvantages of combining parenthood with having to handle responsibilities and problems alone [3, 9]. However, single parents are not necessarily negatively burdened by increased workload and responsibility. A recent study on economically poor single mothers showed a positive mental health effect of full-time employment despite small economic gains [45]. In a study of single mothers specifically, mental health problems was limited to divorced single mothers and not observed in the never married single mothers [1], but the study lacked a non-parent comparison. Indeed, divorce and particularly multiple relationship transitions have been associated with increased anxiety and depression in several previous studies, which has usually been interpreted as resulting from emotional, social and practical strains [42]. Thus, relationship history may be part of the explanation why single parenthood is associated with reduced mental health.

In addition to prior and present strains, a selection process may also be part of the explanation. However, several studies fail to find a selection effect of anxiety or depression related to marriage [26, 34, 44]. In contrast, studies have shown that both depression and anxiety predict divorce and marital instability over the lifetime [40, 41], and that depression is retained across divorce and remarriage [41], at least partly [43]. This is consistent with findings that anxiety as well as depression is often stable or recurrent over time [8, 39], thus possibly contributing to difficulties in maintaining relationships. Hence, the observed elevated anxiety and depression may reflect one of the causes of divorce and therefore single status, and not only reflecting prior and present strains. Our study was not designed to disentangle relationship history in detail. It will be important in future studies on the mental health of different groups of parents to collect such information.

Interpretation focused on social–political context

The result of the present study diverges in part with previous research [7, 9, 17] in not finding an elevated depressive prevalence among single parents (there was only an elevated anxiety prevalence), no mental health difference between married and cohabiting couples (unless divorced), and no differential patterns between mother and father. One interpretative approach to these differences with these previous studies conducted in the US is the social and political difference regarding families and parenthood between the US and Norway. More specifically, there are legal and economic differences as well as differences in attitudes, values, and practices regarding parenthood, single parenthood, divorce, cohabitation, and gender equality between the two countries. Generally, providing advantages for parenting in Norway, these differences may lessen some of the negative effects of parenthood or a disadvantaged situation for some groups in American society. The Norwegian socio-political and cultural context implies that cohabiting parents and single parents as groups are less selected and less stigmatized than in the USA, and live in a society that supports parenthood in legal, economic and practical ways regardless of marital status. From Denmark, where attitudes and social policy are similar, a large twin-study reported substantial positive effect from having a first-born child on well-being and happiness, especially within a relationship, but not when having additional children [23].

In the USA, cohabitation and single parenthood may function as markers for other factors representing the primary mental health risks. For example, US research has led to expectations that cohabiting new mothers are "worse off" than married mothers, because cohabitation is associated with less well-being, poorer health, higher incidence of alcohol abuse and domestic violence, and lower socio-economic status compared to being married [10], although this has not been a uniform conclusion [44]. However, in Norway, cohabiting persons are almost indistinguishable from those who are married in public statistics on health, psychological, and socio-economic factors [33]. This has been attributed to that cohabitation is a widely accepted, essentially normative living arrangement. Cohabitation is also partly equalized to marriage in selected legal and regulatory reforms, such as regarding insurance coverage and tax benefits [14]. Consequently, cohabitants cannot be expected to be as disadvantaged in Norway as in the US.

Single parents may also be less burdened in Norway than in the US. The Norwegian tax and welfare benefits specifically for single parents, combined with general high minimum wages and low unemployment, constitute a favourable economic context for child-rearing parents, whether in a partnership or single status [5, 34]. Moreover, parenthood is encouraged by generous state benefits for parents and high-quality out-of-home day-care is readily available. Such services may buffer some of the traditional burdens of parenthood, especially for single parents. Active fatherhood is also explicitly valued in public debate and political reforms, such as by including fathers in generous parental leave following birth of a child [27]. These contextual factors can go some way towards equalizing the ongoing burdens of parenthood.

Thus, the results of this study may point to that the contextual factors that societies offer families do make a difference, enabling a more positive parental experience and better mental health for parents of different types.

Also, differences in family-related norms result in group compositions that change the value of group factors in large-scale studies in different societies. Cross-cultural longitudinal research contrasting such factors and following individual family history are necessary to understand the complex interplay with mental health for the large majority of people who become parents.

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Study II

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Group and individual stability of three parenting dimensions

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Abstract

Background: The Parental Bonding Instrument, present self-report version, (PBI-PCh) includes three scales, Warmth, Protectiveness and Authoritarianism, which describe three dimensions of current parenting. The purposes of this study were to (1) evaluate the true and observed stability of these parenting dimensions related to older children, (2) explore the distribution of individual-level change across nine months and (3) test potential parental predictors of parenting instability.

Methods: Questionnaires were distributed to school-based samples of community parents of both genders (n = 150) twice, nine months apart. These questionnaires measured parenting, parental personality and emotional symptoms.

Results: Based on 1) stability correlations, 2) true stability estimates from structural equation modeling (SEM) and 3) distribution of individual-level change, Warmth appeared rather stable, although not as stable as personality traits. Protectiveness was moderately stable, whereas Authoritarianism was the least stable parenting dimension among community parents. The differences in stability between the three dimensions were consistent in both estimated true stability and observed stability. Most of the instability in Warmth originated from a minority of parents with personality, childhood care characteristics and lower current parenting warmth. For the Protectiveness dimension, instability was associated with higher Protectiveness scores.

Conclusions: True instability with all three self-reported parenting dimensions can occur across nine months in a community sample related to older children (7-15), but it may occur with varying degrees among dimensions and subpopulations. The highest stability was found for the Warmth parenting dimension, but a subgroup of "unstably cold" parents could be identified. Stability needs to be taken into account when interpreting longitudinal research on parenting and when planning and evaluating parenting interventions in research and clinical practice.

Background

Parenting is a complex aggregation of everyday parental behaviors, cognitions, emotions, attitudes and values under multiple influences, influenced by transactions across time between parental, child and contextual factors [1-3]. This implies influence by both stable and variable sources, which is reflected in the conclusions of the only review or meta-analysis on parenting stability we have found, concluding that "... child rearing is simultaneously enduring and different..." [4]. This complicates the question of how stable parenting is over time. In our view, it implies that some specification relative to population, method, time frame and conceptual level is required when considering the stability of parenting. Furthermore, stability has numerous aspects. It can be addressed as maintained group level or distribution or the individual degree of stability. Whereas stability can also be addressed as the group mean-level developmental change across years, our focus here was restricted to stability and change across months, a time frame where significant group level changes in parenting dimensions are not likely.

Knowledge about the stability and change in parenting across months in the population is important general knowledge. Moreover, this information is imperative when examining change or differences in parenting related to selected *non-ordinary* conditions, such as life-stage changes, dramatic events, illness, treatment processes, and importantly, clinical trials. Changes in parenting observed under these types of conditions may in

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part result from the natural instability of parenting rather than the influence of those conditions.

The meta-analysis by Holden and Miller [4], excluded studies on non-ordinary conditions and found considerable differences in level and variation of stability across time depending on the study method, the parenting construct, the time frame and the subgroups examined. However, in the meta-analysis only six of the time stability studies (11%) involved children above eight years of age and half of these were based on observational methods rather than parent report. Only one of these studies examined time frames of one year or less, and the meta-analysis excluded the few studies involving fathers. None of the included studies investigated individual-level change. Thus, this study's combination of having a time frame of less than a year, assessing parenting of older children and including parent reports of both genders fills a gap in parenting stability research. The Holden review summarized a considerable number of studies on parenting stability, but the topic nearly faded away after 1999. In this introduction, we concentrate on studies after 2000.

Conceptualization and Measurement of Parenting Dimensions

Conceptualizations of parenting may focus on specific daily parenting behaviors or parenting characteristics aggregated across time. *Parenting dimensions* are often used to characterize parenting behaviors by aggregated concepts that are relevant across ages and situations [5] and suitable for reports from parents and other family informants. Holden and Miller [4] found higher stability for more aggregated and parent-centered concepts than age-related and child-centered concepts. However, for older children the stability of parenting dimensions is still not well documented within moderate time frames.

Although there have been various specific conceptualizations of general parenting styles, a recent review [6] concluded that three main themes are present among styles: namely warmth, autonomy support and structure. Related to this general conclusion and based on factor analyses in multiple samples, Kendler [7] proposed three parenting dimensions represented by the scales Warmth, Protectiveness and Authoritarianism, when modifying the Parenting Bonding Instrument (PBI) from earlier work by Parker [8]. Whereas the PBI has been commonly used in parenting research (376 publications across 10 years, including 25 in 2009 according to the ISI - Web of Science), we have not located any reports of stability related to current parenting measured with the PBI. This leaves a gap regarding important characteristics of both this instrument and the concepts it measures.

The two traditional approaches to stability, general developmental stability (group mean-level change) and group differential continuity (stability correlations), are not sensitive to the degree and probability of individual-level stability. However, when change and stability are evaluated under uncommon conditions, for example, in clinical settings, individual change is highly relevant. However, individual-level change as an aspect of stability is largely unexplored in many areas of psychology [9]. We have found only one study on individual-level change in parenting, but this study included only toddlers [10]. Thus, data on individual-level change related to older children are lacking in parenting stability research.

According to Holden and Miller [4], parenting stability is largely the result of parental factors, including childhood care (parenting in the previous generation), adult personality, parenting experience and parent-child gender combinations. However, instability in parenting may instead reflect fluctuations in parental states, situational factors and child behaviors. According to Holden and Miller, long-term developmental change in parenting is largely the result of adaptations to child development [4]. A more recent study by Loeber et al. [11] documented developmental trajectories of parenting aspects as age-curves (6-18years). They also found small or no mean-level changes and stability correlations between .50 and .70 across one-year periods, depending on parenting concept and child age. In an older study by Krampen [12] (included in the review [4]), mothers reported 10-month stability correlations from .61 to .89. These two studies are the only ones we have found on parenting stability within a year related to older children. However, they focused on quite different behavioral categories (child-rearing practices and family interactions), and none of them examined individual-level change.

One Dutch and one American study showed similarity between mothers and fathers in parenting stability across nine years in 3-12 year olds [13] and across one year in toddlers [10], respectively. However, many parenting stability studies include only mothers [4]. Some studies have shown parent gender differences for some aspects of parenting that depend on culture and the organization of daily family life [14]. Thus, gender differentiation in research is needed and extrapolation between genders should not be trusted. Examination of parenting stability should include both parent and child genders.

Holden and Miller [4] emphasized that observational methods will tend to underestimate parenting stability. They also noted a general increase in parenting stability across child age. However, these conclusions were based on studies that confounded child age and method. Other researchers have found that parenting stability does not continue to increase with age among older children [11,15] which should motivate research specifically related to older children.

The Phenomenon of Stability, Time-frames and Stability Indicators

Bugental, Johnston, New and Silvester [16] called for greater attention to the stability of psychological characteristics over and beyond the commonly evaluated test-retest reliability of instruments used to measure those characteristics. When stability is addressed, it is often confused, even equated, with reliability. The true stability of a phenomenon is often only implicitly assumed, and the observed stability characteristics of instruments are often ignored. Another problem is that stability studies are often based on non-representative samples (e.g., patients, people experiencing significant life events) that are not suitable as reference samples [4,16].

In this study, stability will be addressed primarily across moderate time frames of months or less than a year in which developmental mean-level change is expected to be minor, but true change at an individual level still may occur. Investigating stability will only be meaningful within time frames where true change is possible according to the theoretical assumptions of the characteristics in question. The time limits for true change are open to argument for each psychological phenomenon.

The time limits of true change in parenting are not clear, given the multitude of factors influencing parenting, ranging from fluctuating states and dynamic interaction processes to highly stable factors [1-3]. The change in some factors may occur quickly, even over a period of hours and days, but their influence on dimensional characteristics of a person's parenting may still lag and accumulate slowly. Related to younger children, true change in parenting is possible across weeks or months, even for dimensions of parenting [4]. We expect this to also be the case for older children, although the time frames of change and the degree of stability may differ. Challenges of parenting change with the age of the child [11] and previous research indicates that parenting stability also differs as the child ages [4]. However, only minor, mean-level changes have been reported over periods of less than a year for dimensional characteristics of parenting [11].

A time frame of months or less than a year is typical for naturalistic or experimental studies of change under non-ordinary conditions, whereas stability reference information is scarce related to these time-spans and the parenting of older children. Our study will attempt to fill some of this gap by addressing both group distribution stability and individual-level stability of parenting across nine months and focusing children at age 8 and above.

Observed group stability

Stability correlations are the usual method of evaluating group distribution stability or, more precisely, differential continuity. Mean-level change is not included in our study because it is assumed nonexistent in the moderate time frame of nine months used in this study. Stability indicators that describe observed stability are always attenuated by measurement error, but attempts have been made to estimate and evaluate true stability.

True stability

True stability is different from observed stability and instrument test-retest reliability. True stability focuses on real changes in the phenomenon, and is therefore more interesting from a theoretical viewpoint. The weakness of any observed stability indicator is that they will show a mixture of true change and the influence of retest unreliability (i.e., transient and random measurement errors) [17]. Therefore, statistical estimations of true stability require controlling for the influence of measurement error.

Group estimates of true stability were introduced by Spearman [18] in the form stability correlations *corrected for the attenuation from measurement error* (CAME). However, the vulnerability of this estimate to reliability overestimations and correlated errors has drawn criticism [19]. Measuring stability in structural equation modeling (*SEM*) estimating the regression between occasions while allowing for item auto-correlations represents an improvement related to this criticism [20].

Comparative framework

A less sophisticated but practically useful alternative to evaluate true stability, is the comparison of the observed stability of a given instrument to that of an instrument chosen as a benchmark [17]. A good candidate to use as a high stability benchmark would be personality traits, which based on theory and empirical data have relatively high stability among adults [21]. For further comparison, we also included the emotional symptoms of anxiety and depression as phenomena that presumably have moderate to low stability [22]. A comparative ranking of observed stability in a framework of several constructs may add further information about stability characteristics.

Individual-level stability

Stability correlations do not inform about the size or probability of individual change and do not reflect differences in individual-level change. The distribution of individual-level stability, also referred to as individual differences in stability, was calculated in our study as changes in standardized scores (*z*-scores). Using standardized scores, several indicators can describe observed individual-level stability, and can be compared between scales using common criteria in a common metric. The distribution of absolute change in standardized scores reflects variation in individual instability, and its mean can be used as an indicator of central tendency stability. However, by introducing cut-points, probabilities for degrees of individual change regardless of change direction can be calculated (e.g. the

probability for 'changed' or 'no change'). However, there are no established limits for such categorizations.

The only study known to us reporting individual-level change in parenting [10] calculated the Reliable Change index (RC) [23] from a change distribution and used RC as a cut-off limit for evaluating true individual-level change in the same distribution. However, using RC in this way overestimates normal stability, and is a circular approach that violates the assumption that the RC value should be calculated from a distribution of repeated measures representing random measurement error only [23]. Our alternative was to select limits defined by standardized scores as a metric (see later).

A benefit of examining the distribution of individual-level change is that it may reveal |subgroups indicated by unevenly distributed stability. A representative community sample must be expected to include a relatively low prevalence of individuals subjected to *non-ordinary* individual or family factors, events or adversities that could affect the stability of parenting. A low prevalence will not affect the main distribution of change considerably, but such variation will always create background "noise" in the analysis of systematic differences in clinical and research interventions. When such non-ordinary variation is more prevalent (as in at-risk- and disadvantaged populations), its extent and sources are more important to uncover.

Whereas predictors of stability or instability are not the primary aim of this study, their associations may also inform an evaluation of stability. If the observed instability of a phenomenon is related to a known factor, it is unlikely that the observed change is only the result of random or transient change. All factors that influence parenting may predict its stability [4], including personality traits, childhood care, adult parenting experience and emotional problems [24,25]. Therefore, in the present study, these influences are investigated together with age and gender as potential predictors of parenting stability.

Aims

The primary aims of this study were (1) to evaluate the stability characteristics of the three parenting dimensions warmth, protectiveness and authoritarianism across nine months related to older children as expressed by (a) stability correlations, (b) true stability estimates and (c) the distribution of individual change, (2) to compare these stability characteristics to those of parental personality traits and emotional symptoms, (3) to examine associations between parenting instability and parents' gender, age, personality traits, previous generation parenting, parenting experience and emotional symptoms (anxiety and depression) to illuminate possible stability predictors and characteristics of stability subgroups.

Methods

Sample and Procedure

Parents were invited for Wave 1 from 20 randomly selected public schools in two counties. Of 558 eligible parents, 442 participated at the first time-point, T1. Half of them (n = 220) were randomly selected to participate again in Wave 2 nine months later for the purpose of this study, and 150 did so at the second time-point T2 (68% of those invited for Wave 2). No considerable differences were found between the Wave 2 participants, T2 dropouts or all those participating only in Wave 1. The nine-month time interval was chosen because it is suitable for investigating stability of parenting in a time frame without mean-level change and because it is comparable to the six to twelve months follow-up periods often chosen in clinic trials Questionnaires were distributed in closed envelopes to the children of participants who took them home from school, and they were returned by prepaid post. For the majority of children (68%), both a father and a mother completed the measures. The final sample at T2 included urban areas, small towns and rural districts, showing no significant differences in parenting scores. Parental age ranged from 26 to 58 years with a mean of 40.6 years (SD = 5.6), and 59% were mothers. Age of the children ranged from 8 to 15 years (M = 11.4, SD = 2.9), and their parents had 1 to 6 children, (M = 2.6, SD = 0.9).

The study was registered at the Norwegian Social Science Data Services and complied with the Helsinki Declaration. Approval was also obtained from the management of each of the schools for the study to be carried out in their respective schools, and written informed consent was secured from all parents by the school management.

Instruments

Current *parenting* and *previous generation parenting* were measured in this study using Kendler's modification of the Parental Bonding Instrument (PBI) [7]. The modification reduced PBI to 16 items and constructed scales based on factor-analysis with varimax rotation. Factors with eigenvalues greater than unity were extracted into seven materials representing different informant positions. This construction procedure resulted in a strong three-factor solution independent of informant position, comprising the scales Warmth, Protectiveness and Authoritarianism [7]. These dimensions will be capitalized throughout this paper when referring to the PBI scales, but not when referring to them as concepts. The Warmth scale aggregates parenting characterized by positive emotions and empathic communication ("...talks with a warm and friendly voice..."), the Protectiveness scale comprises protection and infantilization ("...treat as younger..."), and the

Authoritarianism scale covers parenting that restricts and directs the child ("...decide for him/her...") [7]. The self-report parent version asking about current parenting is referred to here as PBI-PCh. The offspring informant version asking adults about their retrospective childhood experiences of parenting is termed *previous generation parenting*, and describe separately the recalled maternal (PBI-M) and paternal (PBI-F) relationship (jointly referred to as PBI-M/F). Unless specified as *previous generation parenting*, the term 'parenting' throughout this paper refers to current parenting (PBI-PCh).

Emotional symptoms were measured with the Hospital Anxiety and Depression Scales (HADS), a self-report instrument of depressive and anxiety symptoms [26]. Separate scores are produced for Anxiety (A) and Depression (D) scales. With the exception of stability, the psychometric properties of these scales have been well documented [27]. Stability is only known in terms of movement in and out of "clinical caseness" (score ≥ 19) which showed considerable fluctuation across time for both anxiety and depression [22].

Personality traits were measured with a short-version of the NEO-PI [28], a measure of the "Big Five" personality traits (Neuroticism - N, Extraversion - E, Agreeableness - AE, Conscientiousness - C, Openness - O) with a highly replicable factor structure. The 100-item short-form of NEO-PI used here replicates the original factor structure and has corresponding high internal consistency for all five domains using 12 to 29 items for each domain [29]. The NEO-PI is used as a high stability benchmark. The literature is not consistent in identifying one NEO-PI dimension as having the highest stability, although Extraversion, Openness and Neuroticism are the primary candidates [21].

Statistics

A comparison of the sampling groups in an unconditional random-effect regression effect model did not reveal significant sampling site contributions. Moreover, significant mother - father correlations within families were not found for any of the 16 instrument scales, confirming that a multilevel approach was not required.

The conversion of scales to standardized *z*-scores was performed relative to gender and age distributions from the total T1 sample of this study (N = 442). Based on changes in *z*-scores, indicators of individual-level variation in stability were calculated. Lacking short-term test-retest values, cut-points were chosen based on Cohen's [30] recommendations for evaluating effect size, which propose z = .20, .50 and .80 as characteristic of small, moderate and large change in standardized group mean, respectively. Because our focus here is absolute individual change, which is more influenced by measurement error than group mean change, it was pertinent to set the lower limit for a considerably changed score at changes exceeding one standard deviation (i.e. absolute change Δz > 1.0) and calculating $\boldsymbol{P}|\Delta|>1z$ to represent its expectancy rate (denoted '*changed*' when referring to this definition). In a similar way one half of a standard deviation was chosen as an upper limit for negligible change, calculating the rate of T1-T2 differences smaller than 0.5 *z*-score as indicator ($\boldsymbol{P}|\Delta|<0.5z$, denoted '*no change*'). The rate of inter-mediate change ranging from 0.5 to 1.0 in absolute z-score change ($\boldsymbol{P}|\Delta|0.5\text{-}1z$) was included only for supplemental purposes (denoted '*uncertain change*').

The absolute change in z-scores ($|\Delta|z$) was also used as a continuous variable in some analyses, and its mean ($\boldsymbol{M}|\Delta|z$) was calculated as a group stability indicator. The association between the categorization of absolute change ('no change' 'uncertain' and 'changed') and score level on both T1 and T2 was combined and tested as a between-subject effect in a T1-T2 repeated measures General Linear Model (GLM) in SPSS, with post-hoc Bonferroni contrasts between 'change' groups. To examine stability correlations between continuous variables, the Pearson product-moment correlation coefficient was used, denoted $\boldsymbol{r}$ for stability correlation and r for other correlations.

Using a comparative framework of other measures to evaluate observed stability requires that error-related psychometric properties of the included scales are acceptable and comparable. Especially important is scale unidimensionality in combination with scale internal consistency. These are estimated as the unidimensionality index *Comparative Fit Index* (*CFI*) and Cronbach's *alpha*. *CFI* was calculated in LISREL and considered acceptable if higher than .80, as recommended by Rogers et.al [31]. Because a low number of items reduces *alpha* significantly and the scales used here vary from four to 29 items, the average inter-item correlation (r^{M}) [32] has also been reported in Table 1. Unacceptable unidimensionality (*CFI*s < .80) in combination with reduced internal consistency and low inter-item correlations indicated scale construction problems for the Extraversion and Conscientiousness scales of this short version of the NEO-PI (see Table 1). Therefore, these two scales were excluded from further comparative analyses.

For true stability estimates, $\boldsymbol{r}^{SEM}$ (γ regression term in LISREL output) were calculated in LISREL by regressing T2 on T1 latent scales in *SEM*, following procedures described by Jöreskog and Sörbom [20] and illustrated by the conceptual model in Figure 1. Calculations were performed separately for each of the eight subscales used in the comparative framework. The latent T1 and T2 scales were estimated from the respective T1 and T2 responses to items constituting the scale, allowing for T1-T2 item autocorrelations. In addition, selected error term correlations between items within T1 and

Table 1 True and observed stability indicators across 9 months (T1-T2) and internal consistency for current parenting, personality traits and emotional symptoms

	T1 *alpha*	T1 r^M	T1 *CFI*	T1-T2 r^{SEM} (*s.e.*)	T1-T2 *r*	T1-T2 *M*|Δ|*z*	T1-T2 .*P*|Δ|>1*z*	T1-T2 *P*|Δ|<0.5*z*
Current parenting (Parental Bonding Instrument -PBI-PCh)								
Warmth	.77	.33	.98	.82 (.14)	.67	0.59	20%	62%
Protectiveness	.69	.31	.97	.69 (.14)	.58	0.69	24%	55%
Authoritarianism	.51	.21	.98	.62 (.14)	.49	0.77	29%	29%
Personality traits (NEO-PI short version)								
Neuroticism	.91	.27	.94	.87 (.12)	.86	0.39	6%	72%
Extraversion	.63	.11	.56	.85 (.18)	.69	0.63	20%	43%
Agreeableness	.86	.20	.82	.91 (.14)	.82	0.47	9%	64%
Conscientiousness	.72	.12	.61	.92 (.26)	.76	0.52	13%	57%
Openness	.82	.21	.84	.91 (.12)	.81	0.47	9%	60%
Emotional symptoms (Hospital Anxiety and Depression Scales -ADS)								
Anxiety	.80	.38	.97	.81 (.09)	.72	0.55	15%	53%
Depression	.72	.27	.97	.74 (.13)	.65	0.60	22%	62%

r = stability correlations T1-T2, *alpha* = Cronbach's internal consistency alpha, r^M = average inter-item correlation, *CFI* = Comparative Fit Index, r^{SEM} = true stability estimates in Structural Equation Modelling (*SEM*), *s.e.* = standard error of the r^{SEM} estimate, *M*|Δ|*z* = mean absolute change, *P*|Δ|>1*z* = rate of absolute change > 1.0z, *P*|Δ|<0.5*z* = rate of absolute change < 0.5z.

T2 were allowed, only if these increased the model fit. This was the case for a smaller proportion of error term correlations (Warmth 4/43, Protectiveness 2/20, Authoritarianism 0/12, Neuroticism 20/812, Agreeableness 34/650, Openness 4/122, Anxiety 0/42, Depression 0/42). All eight estimation models produced fit indices *RMSEA* < .09, *RMR* < .09 and *CFI* >.93 (except the two previously excluded NEO-PI scales). The true stability (r^{SEM}) estimation procedures resulted in confidence intervals ranging from .36 to .56 within the absolute range of 0 to 1.0. Because testing the statistical significance of differences in r^{SEM} would have required a much larger sample, such tests were not performed here.

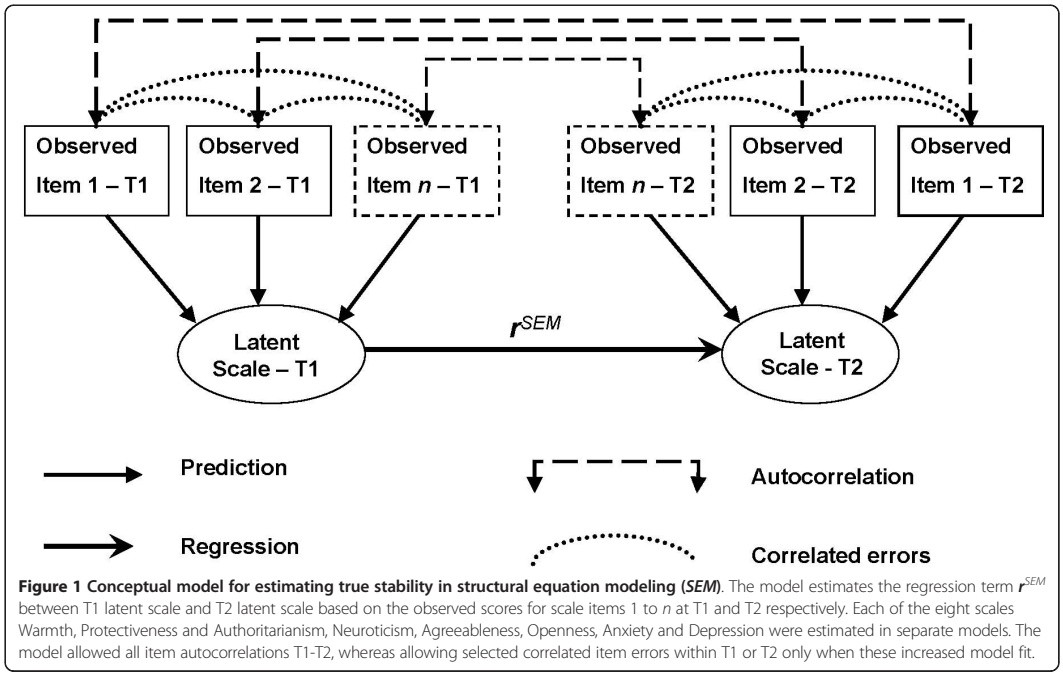

Figure 1 Conceptual model for estimating true stability in structural equation modeling (*SEM*). The model estimates the regression term r^{SEM} between T1 latent scale and T2 latent scale based on the observed scores for scale items 1 to *n* at T1 and T2 respectively. Each of the eight scales Warmth, Protectiveness and Authoritarianism, Neuroticism, Agreeableness, Openness, Anxiety and Depression were estimated in separate models. The model allowed all item autocorrelations T1-T2, whereas allowing selected correlated item errors within T1 or T2 only when these increased model fit.

Difference in rates of 'changed' or 'no change' between scales were tested in one-sample binomial tests. Difference between stability correlations ***r*** were tested for statistical significance by converting each difference to a *z*-score relative to sample size (Fisher's transformation), and examining its probability as a *t*-test. This was calculated in Excel. When not otherwise specified, calculations and analyses were performed in SPSS 16.0.

Associations between potential predictors and individual-level *instability* in parenting dimensions, as expressed by the continuous variable of absolute change in z-score ($|\Delta|z$) T1-T2, were examined with product-moment correlations between instability ($|\Delta|z$) and predictors measured at both T1 and T2, but only those correlations replicated at both T1 and T2 were considered reliable and reported.

Results

Observed stability correlations ***r*** and true stability estimates r^{SEM} for all scales across nine months are reported in Table 1 together with the three *z*-based distributional characteristics of individual-level stability ($M|\Delta|z$, $P|\Delta|>1z$, $P|\Delta|<0.5z$) and internal consistency *alpha*. The true stability estimates r^{SEM}, stability correlations ***r*** and the *z*-based indicators $M|\Delta|z$ with confidence intervals are also illustrated in Figure 2. The prevalence of 'changed' scores ($P|\Delta|>1z$) and 'no change' ($P|\Delta|<0.5z$) are illustrated in Figure 3, which also includes confidence limits for these two rates and shows the intermediate 'uncertain change' proportion $P|\Delta|0.5\text{-}1.0z$. This intermediate proportion is informative primarily because a small proportion can indicate split distributions. Table 2 shows statistical tests comparing the stability of PBI parenting dimensions to the stability of personality traits and emotional symptoms.

PBI-PCh Stability Indicators

As shown in Table 1 and illustrated by Figure 2 and 3 the stability of the three parenting dimension scales was consistently ranked in the same order regardless of which indicators were used. Warmth showed the highest stability, Protectiveness intermediate stability and Authoritarianism the lowest stability among the three.

When testing for differences in stability between the parenting dimensions, only the contrast between Warmth and Authoritarianism reached statistical significance when evaluated by observed stability correlations ***r*** (Δr = .18, p < .01) and the probability for 'changed'

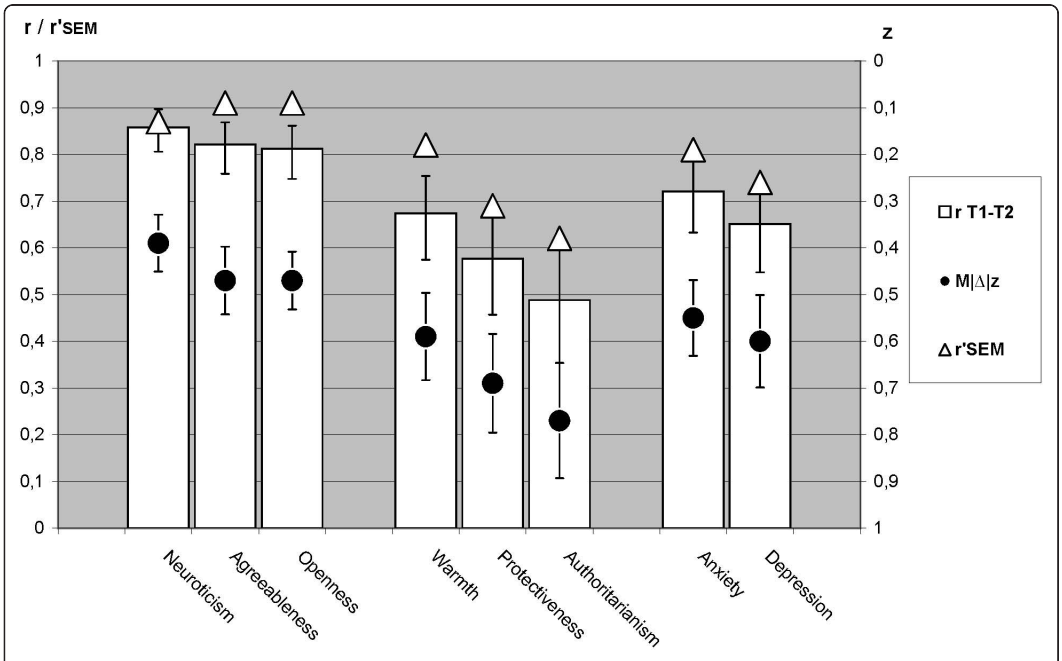

Figure 2 Observed and true stability. Observed stability correlations ***r*** (bars, with scale on the left) and mean absolute standardized change $M|\Delta|z$ (black filled circles, with scale on the right) for each scale, with 95 percentile confidence intervals indicated for both. True stability estimates from *SEM* analyses are indicated with triangles. Both vertical scales are arranged with maximum stability at upper end.

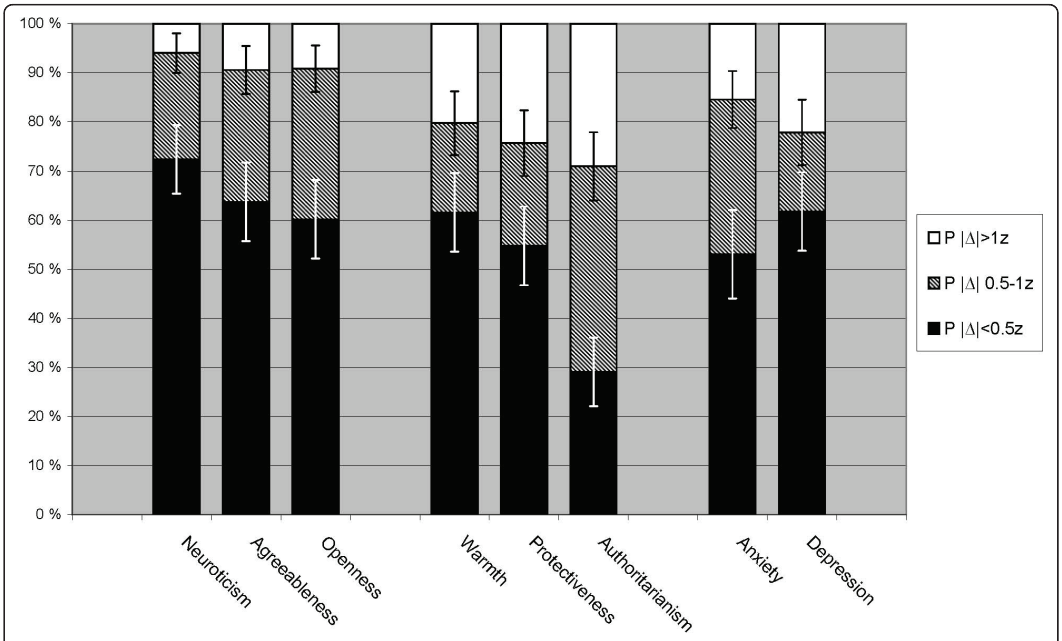

Figure 3 Prevalence of 'changed' *P*|Δ|>1*z* and prevalence of 'no change' *P*|Δ|<0.5*z* with 95 percentile confidence intervals indicated for both, combined in cumulative bars with the intermediate 'uncertain change' *P*|Δ|0.5-1*z* to illustrate distribution of individual stability.

Table 2 Differences in stability, compared pairwise between current parenting dimensions (columns) and personality traits or emotional symptoms (rows)

		Current self-reported parenting (Parental Bonding Instrument)		
		Warmth	**Protectiveness**	**Authoritarianism**
Personality traits (NEO-PI)				
N	Observed stability	**Δ*r* = -.19, *p* < .001**	**Δ*r* = -.28, *p* < .001**	**Δ*r* = -.37, *p* < .001**
	'Changed' ***P*|Δ|**>1*z*	**+14%, *p* < .001**	**+18%, *p* < .001**	**+23%, *p* < .001**
	'No change'***P*|Δ|**<.5*z*	**-10%, *p* < .010**	**-17%, *p* < .001**	**-43%, *p* < .001**
A	Observed stability	**Δ*r* = -.15, *p* < .01**	**Δ*r* = -.24, *p* < .001**	**Δ*r* = -.33, *p* < .001**
	'Changed' ***P*|Δ|**>1*z*	**+11%, *p* < .010**	**+15%, *p* < .001**	**+20%, *p* < .001**
	'No change'***P*|Δ|**<.5*z*	-2%, *ns.*	**-9%, *p* < .010**	**-35%, *p* < .001**
O	Observed stability	**Δ*r* = -.14, *p* < .01**	**Δ*r* = -.23, *p* < .001**	**Δ*r* = -.32, *p* < .001**
	'Changed' ***P*|Δ|**>1*z*	**+11%, *p* < .010**	**+15%, *p* < .001**	**+20%, *p* < .001**
	'No change'***P*|Δ|**<.5*z*	+2%, *ns*	-5%, *ns.*	**-31%, *p* < .001**
Anxiety/Depression (HADS)				
A	Observed stability	Δ***r*** = -.07, *ns*	**Δ*r* = -.14, *p* < .025**	**Δ*r* = -.21, *p* = .001**
	'Changed' ***P*|Δ|**>1*z*	+5%, *ns*	+9%, *ns*	**+14%, *p* = .037**
	'No change'***P*|Δ|**<.5*z*	+9%, *ns.*	.+2%, *ns.*	**-34%, *p* < .001**
D	Observed stability	Δ***r*** = +.02, *ns*	Δ***r*** = -.07, *ns*	**Δ*r* = -.16, *p* < .025**
	'Changed' ***P*|Δ|**>1*z*	-2%, *ns*	+2.1%, *ns*	**+7%, *p* < .05**
	'No change'***P*|Δ|**<.5*z*	-0.2%, *ns.*	-7.0%, *ns.*	**-32.6%, *p* < .001**

Observed stability correlations and the prevalence of individual-level change are compared separately.

NEO-PI = Big Five Personality Inventory (short version), HADS = Hospital Anxiety and Depression Scales, N = neuroticism, A = agreeableness, O = Openness, Δ*r* = stability correlation difference, Δ% = rate difference - one-sample binomial test, *ns.* = non-significant, *p* = One-sided test of statistical significance, *P*|Δ|>1*z* = rate of absolute change > 1.0*z*, *P*|Δ|<0.5*z* = rate of absolute change < 0.5*z*.

scores ($P|\Delta|>1z$ - ΔP = 9%, p < .01). The Protectiveness stability correlation was not significantly different from those of the other two dimensions. Additionally, for Authoritarianism, the 'no-change' probability ($P|\Delta|<0.5z$), indicating very low stability, was significantly different from both Warmth and Protectiveness (ΔP = 32% and 25%, p < .01), whose mutual difference was not significant.

Comparative Framework

Personality traits had been chosen to represent high stability in the comparative framework. As shown in Table 2 all stability indicators used here showed higher stability for neuroticism than for any of the parenting dimension. For personality agreeableness and openness, only the 'no change' probability ($P|\Delta|>1z$) deviated from this main pattern. Parenting warmth showed a split distribution of individual change in that 62% showed 'no change' and 20% showed 'changed' warmth (see Table 1). This split pattern was highly similar to the stability distribution characteristics of depression.

As shown in Table 2 the moderate stability revealed for Protectiveness, was clearly lower than that of personality traits. Protectiveness was only somewhat lower than depression or anxiety, only significantly different from the anxiety stability correlation, not for any aspect of individual-level change. In contrast, Authoritarianism was even less stable, indicated by the low 'no-change' rate $P|\Delta|<0.5z$ = 30% (lowest among all included scales) and the high rate of 'changed' scores $P|\Delta|>1z$ = 29% (highest among all scales). The stability correlation of Authoritarianism, r = .49, was significantly lower than for all other scales, and the true stability estimate r^{SEM} = .62 was lowest among all scales.

Associations with Parenting Instability

Testing the association between individual-level 'change' categories and score level within dimensions showed that the most stable group for Warmth was characterized by significantly higher Warmth scores ($F(2,140)$ = 5.97, MSE = 1.62, p = .003). The Bonferroni post hoc contrasts revealed significantly higher Warmth only in the contrast of the 'no-change' and 'changed' group (Δz = +.65 cl95 ± .45, p = .003).

Instability in Warmth ($|\Delta|z$) was negatively associated with NEO-PI Agreeableness (both r_1 and r_2 = -.25, p < .05), and NEO-PI Openness (both r_1 and r_2 = -.22, p < .05). Warmth instability ($|\Delta|z$) was also negatively associated with previous generation maternal Warmth (r_1 = -.17 and r_2 = -.18, p < .05) but not to current parental emotional symptoms.

For Protectiveness, the most stable group was characterized by significantly lower Protectiveness scores ($F(2,145)$ = 3.59, MSE = 1.60, p = .030). The Bonferroni post hoc contrasts revealed significantly lower Protectiveness only in the contrast between 'no-change' and the 'changed' group (Δz = -.48 cl95 ± .43, p = .025). For Authoritarianism there were no reliable associations between stability categories and score levels.

The instability of Protectiveness and Authoritarianism was not associated with any of the potential parental predictors measured by PBI-M/F, NEO-PI(sv), or HADS. Child age or gender, parental age or gender, or parental experience (number of children) was not associated with the instability of any of the parenting dimensions.

Supplementary analyses

Mothers reported significantly higher Warmth than fathers at both T1 and T2 by .06-.07 SD in a GLM analysis ($F(1/146)$ = 19.85, MSE = 10.03, p < .001), but no difference for Protectiveness and Authoritarianism. Child gender was not significantly related to stability for any parenting dimension. All stability analyses were corrected for parent gender difference through conversions to gender-related z-scores.

The three parenting dimensions correlated only weakly (r = -.18 to +.32, p < .01). Moreover, their directional change T1-T2 and absolute change T1-T2 were not significantly correlated between dimensions. There was no mean-level change from T1 to T2 for any parenting dimension, and individual changes in either direction were equally frequent.

Discussion

The three self-reported parenting dimensions exhibited different levels and patterns of stability over nine months in parents of older children (7 to 15 years). This general pattern of stability was consistent using all three statistical approaches to stability: estimated true stability, observed stability correlations and individual-level change, as illustrated in Figure 2 and 3.

Parenting warmth was rather stable; although not as stable as personality traits, it was similar to the stability of depressive symptoms. As with depressive symptoms, instability in warm parenting originated mainly from a subgroup consisting of 20% of the sample. Unstable warmth was associated with low personality trait scores on agreeableness and openness and with low childhood maternal warmth; however, it was not associated with current depressive symptoms.

Protectiveness was moderately stable, similar to stability in anxiety symptoms, whereas Authoritarianism showed lower stability than all of the other scales tested, although still in the lower moderate stability range.

Comparing our observed stability correlation for warmth (.67) to previous studies with older children, Krampen [12] found a higher stability correlation of .86 for emotional warmth, and Loeber found correlations

around .69 for "bad relationship" [11]. The authoritarianism and protectiveness concepts from PBI are less easily compared to the concepts in these two other studies [11,12], but concepts associated with use of dominance and supervision tended to produce lower stability correlations than warmth in both studies.

These estimates and stability correlations for older children from our study and other studies [11,12] appear high compared to stability data reported in the meta-analysis by Holden and Miller [4]. However, in their meta-analysis, the dominance of observational studies that focus on more specific parenting behavior related to younger children can explain this difference.

Previous studies of parenting stability have varied considerably in levels of conceptualization, methods of investigation and child age [4,10,11,15]. However, differences in stability between parenting aspects were rarely addressed directly in discussions of stability, although such variation were often reported in the empirical results.

Converting our true stability estimates (r^{SEM}) into R^2-values (as seen in Table 1) showed that true stability explains 67% of the variance in parental warmth, 48% for protectiveness and 38% for authoritarianism over nine months. We will argue that high stability requires at least 50% explained variance based on true stability estimates (correcting for measurement error) for trait-like parenting concepts. This leaves warmth as the most stable parenting dimension in our study relatively, whereas protectiveness and authoritarianism can best be characterized as high and low within the moderately stable range. This is consistent with our individual-level analyses, which showed that the observed stability correlations concealed considerable instability in protectiveness and especially in the authoritarianism dimension.

Considering the combined influence on parenting of parent, child and contextual factors with quite different stability, variation in stability between parenting dimensions may reflect different influences from stable and fluctuating factors [4]. Groups of parents with different contextual conditions, parent or child characteristics, may thus show corresponding differences in parenting stability. Community parents in Norway should be representative of parenting in a quite safe and advantageous context with relatively low prevalence of non-ordinary conditions.

Dimension-specific patterns and associations with stability

The majority of parents (63%) showed highly stable scores on the warmth dimension, typically at a "warm" level. However, warmth tended toward a split stability distribution, as a subgroup of parents (20%) displayed instability and a "colder" mean score compared to stable parents. Instability in warmth was also associated to lower scores for agreeableness and openness as personality traits, and colder previous generation maternal relationship.

This split stability pattern between a majority and a dysfunctional minority is strikingly similar to that of depressive symptoms. Depressive symptoms are known for their fluctuations and recurrences in vulnerable subgroups in the population [33]. A less-clear split pattern of instability associated with high protectiveness scores was found, suggesting 'inconsistent overprotection'. No other parent or child variables were predictive of protectiveness instability.

Rather than being observed only in a sub-group, some instability in authoritarianism was widespread. Taken together, these results raise the question of whether child or contextual factors not evaluated here may identify subgroups of instability for protectiveness or authoritarianism.

Some of the observed stability of authoritarianism and, to some degree, protectiveness may be due to measurement errors indicated by reduced internal consistency. However, the stability is too low to be accounted for only by error. Furthermore, *alpha* for these two scales is deflated by a low number of items. Additionally, the scales of PBI and those three used from NEO-PI have similar average inter-item correlations and good unidimensionality (see Table 1), and the true stability estimates show the same pattern of stability between dimensions. Still, the conclusions must be treated with some caution due to the wide confidence intervals of the true stability estimates.

The few differences between fathers and mothers should probably be interpreted in relation to contemporary cultural trends in Norway that favor gender equality and fathers are highly involved in daily child care and -rearing [34]. The cultural values of gender equality may influence how parents report on their parenting. However, the relatively broad parenting dimensions may not capture more subtle gender differences in parenting.

The instability in authoritarianism may suggest influence from rather common but fluctuating factors, such as parental challenges arising from disputes over rules and privileges. This is consistent with the lack of associations between stability and fixed parental or child factors. An interpretation related to local cultural attitudes disfavoring authoritarianism in Norway [35] is also possible. These may leave authoritarian strategies as an underreported occasional practice rather than a stable parenting style among the majority of parents. Finally PBI Authoritarianism scale may be too sensitive to ordinary aspects of parenting authoritarianism, and less sensitive to more clinical important dysfunctional aspects.

Examining the distribution of individual-level stability added important nuances to the stability characteristics beyond the information provided by stability correlations.

The combined picture produced by rates of 'changed', 'uncertain change' and 'no change' in individual-level stability could reveal whether instability is widespread or only present in a minority group. The distribution of individual change can also describe instability in terms that are more easily related to clinical practice and intervention research by directly stating, related to chosen criteria, how common changes might occur.

Implications for clinical and research application

A cold relationship, especially in combination with restrictiveness or harshness, has long been considered a pathogenic parenting factor [36]. However, more recent research suggests that inconsistency in parenting, especially "love inconsistency" [37] is a more potent pathogenic factor than stable cold or authoritarian parenting [38,39]. Related to anti-social behavior in children, the importance of inconsistency was raised early [40] Our study shows an association between instability and cold parenting, and suggests that there is a danger of overlooking inconsistency of both parental warmth and protectiveness in assessing these dimensions unless they are evaluated across time. Furthermore, occurrences of authoritarian parenting on single occasions will be a weak clinical indicator because fluctuations are common in this dimension. Again, assessment over time will provide a better clinical picture.

Regarding parenting interventions targeting warmth and adequate use of authority, these stability results imply that long-term stabilization and consistency of improvement should be assured. Furthermore there is a need for differentiation between inconsistency and inadequate levels when addressing parenting factors as risks.

Strengths and Limitations

The primary strength of this study was the comparison of results across different indicators of stability, which expands the traditional focus on group stability correlations with true stability estimates and individual-level stability characteristics. Another strength was that several dimensions of parenting were compared and evaluated in reference to other psychological characteristics. Finally, regarding instability predictors, only replications across T1 and T2 were considered reliable.

The primary weakness was that a larger sample would have allowed for more accurate estimates and reduced confidence intervals, especially for true stability estimates [17]. The age range of children in this study does not allow generalizations to be made about younger children or older adolescents. The use of self-reports on parenting could have resulted in some overestimation of stability. Thus, replication of the findings using other informants could prove interesting. However, Krampen [12] found higher stability in parenting with reports from teenage child informants than they did with in parent self-reports, showing that self-reports do not necessarily produce the highest stability indications.

Wide confidence intervals for the true stability estimates in *SEM* weaken the basis for strong conclusions, although these estimates lead to the same conclusions as those reached based on observed stability correlations and individual-level change.

Comparison of observed stability is complicated by the differences in internal consistency, suggesting a different influence from measurement error, especially for the authoritarianism scale. Some of these differences are related the low number of scale items, which tend to deflate *alpha* [32] although average item intercorrelations are rather similar for the PBI-PCh and the three included NEO-PI scales.

Conclusions

The three parenting dimensions varied considerably in their stability across nine months among parents of older children. Although highly stable among the majority, change in warmth was observed in a subgroup of parents, resulting in lower stability than personality traits. In comparison, protectiveness was moderately stable, and authoritarianism appeared as the least stable dimension, although still in the lower moderate range. Thus, true fluctuations in self-reported parenting dimensions must be considered quite possible across months, even in ordinary samples, although the degree of change may depend on the parenting dimension and the selected population.

Even when using the PBI, which is based on parenting concepts approaching a trait level of aggregation, and assessing parenting over a relatively short time-span of nine months, none of the three parenting dimensions approached the stability level of personality traits. Rather, the parenting dimensions showed stability characteristics more similar to emotional symptoms like anxiety and depression, and even less stable.

Specifying influences of stability and change on each parenting aspect may be necessary to improve our understanding and ability to target parenting effectively in interventions. It is also important to bear in mind that although consistent warmth is optimal, protection and authority in parenting rather requires flexibility related to changes in child and contextual challenges. Adequate parenting related to these dimensions may require that parents pursue a dynamic rather than fixed balance between safety and expansion and between guidance and autonomy [4].

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Authors' contributions
TR conceived and planned the study, conducted literature review, data collection and data analysis, composed the initial draft of the manuscript and responded to reviewer revisions. JW contributed in writing the manuscript, especially the introduction and discussion. TSBN contributed to the selection of instruments, and to the interpretation and presentation of the study in writing the manuscript. All authors read and approved the final manuscript.

Competing interests
The authors declare that they have no competing interests.

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Study III

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Change in self-reported emotional distress and parenting among parents referred to inpatient child psychiatric family treatment

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Rimehaug T, Berg-Nielsen TS, Wallander J. Change in self-reported emotional distress and parenting among parents referred to inpatient child psychiatric family treatment. Nord J Psychiatry 2011;Early Online, 1–8.

Aims: Our aim was to examine changes in distress symptoms and parenting dimensions among parents in child psychiatry services (*clinic parents*) ($n = 102$). Parents were followed from referral and admission to 3-month and 12-month follow-ups of "treatment-as-usual" at inpatient *family clinics*. These measurements were compared with a sample of *community parent* ($n = 439$) standards. *Methods*: Standardized questionnaires measuring the child's problems, parental anxiety and depression symptoms (distress), and warmth protectiveness and authoritarianism (parenting dimensions), were distributed to parents four times (T0–T1–T2–T3). The family clinics received families whose children had long-term problems and unsatisfactory previous treatment outcomes. *Results*: Clinic mothers, but not fathers, showed an improvement in distress symptoms at the 3-month (T2) and 12-month (T3) follow-ups relative to at admission (T1). Nevertheless, clinic mothers displayed distress symptoms at all measurement points compared with community parents. Parents of children with learning/developmental problems and attention disorders showed significantly higher warmth scores at the 3-month and 12-month follow-up compared with at admission, although the levels remained lower than those of community parents. In contrast, parents of children with emotional problems showed the same level of *warmth* as community parents and lower levels of *protectiveness*, but no change in these parenting dimensions T1–T2. *Implications*: Parental emotional distress symptoms and parenting characteristics should be addressed systematically in child psychiatry to inform evaluations of the context of the child's problems and the family's treatment needs. Systematic and effective treatment components related to parenting should be implemented.

• *Authoritarianism, Internalized problems, Protectiveness, Treatment-as-usual, Warmth.*

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The heterogeneous population of parents with children receiving psychiatric treatment, denoted here "clinic parents", is rarely the primary target of research. Yet, it is commonly accepted that caring for children with prolonged psychiatric problems can be emotionally taxing and burdensome. As many as one out of ten parents experience burdens in their parenting role because of their child's mental health problems (1), and many parents of these children are known to suffer from self-blaming (2) and emotional distress (3) increasing with the severity and duration of problems and when externalizing problems are present (4, 5). Whereas the influence of children's chronic and serious *somatic* illness and intellectual disability on their parents has been studied well (6, 7), relatively little has been documented for parents with children who have psychiatric problems.

Traditionally, parents' emotional distress and parenting problems have primarily been viewed as risk factors when observed together with a child's problems (1), although clinicians are increasingly aware of the bi-directionality of effects between child and parent (8). Utilizing parents as resources in treatment and aiding them in improving their parenting requires knowledge about clinic parents as a heterogeneous group. The present knowledge about these parents is insufficient. The aim of the current study is to increase this knowledge.

Examining parents at selected time-points related to child treatment may increase our understanding of the

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interplay between child and parent functioning in families with children who have psychiatric problems. We examined parents before a waiting period, at admission to treatment, and at 3-month and 12-month follow-ups. Waiting for, entering and participating in treatment may alter distress levels and parenting. Changes at 3-month follow-up may be sustained or may deteriorate by the 12-month follow-up. However, in the naturalistic design of this study, the influence of situational, child and parental factors cannot be definitely separated.

Parents who accompanied their children in inpatient child psychiatric *family clinics* were chosen for this study because referrals to these clinics typically follow a long history of severe childhood problems with prolonged and unsuccessful treatment at previous service levels. Conceivably, these parents have experienced prolonged strain and distress (4, 5), and their functioning likely differs from that of community parents (8). Furthermore, the therapeutic programme is characterized by extensive parental involvement (9), increasing the probability of parental change.

Parenting dimensions, rather than specific behaviours, were chosen as a parsimonious representation of parenting (10) in this study. The dimensions of warmth, protectiveness and authoritarianism proposed by Kendler (11) based on dimensions previously developed by Parker et al. (12) have been shown to be relevant for child mental health (13, 14) and have been frequently used in research on psychiatric risks (8). Furthermore, these dimensions were suitable because of the availability of corresponding data on community parents in the area (15), and they have been found to differ between clinic and community parent samples (in part depending on gender) in our previous research (unpublished data). These results also strengthened the motivation for including gender differences and interactions in the analytic strategies (16).

Anxiety and depression symptoms were chosen because they indicate distress as well as possible clinical conditions (17). Associations between parenting, parent psychopathology and child problems shown in previous studies (13) motivated the exploration of whether the results were confined to parents of children with specific diagnoses.

Aims

The aim of this study was to examine changes in self-reported parenting dimensions and levels of emotional distress among parents of children who were referred to child psychiatric family inpatient clinics. Changes between referral, admission and 3-month and 12-month follow-ups were examined, and levels contrasted to community parent standards. We also examined whether changes in parenting dimensions and emotional distress were related to one another, parental gender, demographics, or child problems and diagnosis. Although changes across time were assessed, this naturalistic study did not aim to evaluate treatment effect.

Materials and Methods

The clinic parent samples

The clinic parents were recruited from families referred to three child psychiatric family inpatient units (denoted *family clinics* in the following). Referred parents were consecutively invited to participate during a 4-year period. The catchment area included two cities, several small towns and large rural areas. Of 160 eligible parents, 151 gave their informed consent to participate. Of these participants, 139 completed the main data collection at admission (T1) to the family clinic (87% of those eligible), and 102 completed the 3-month follow-up after discharge at T2 (representing 64% of those eligible). Of these 102 participants, 64 (40% of the originally eligible, 61% of T2 participants) completed the 12-month follow-up T3 assessment. Because of practical problems, as often occurs in naturalistic settings, the T0 measurement was only collected from a subsample of 15 out of the *last* 16 parents invited into the study (representing 9% of those eligible, 15% of T2 participants). Thus, the T0 measurement could only be used as a supplementary exploration of the stability of the T0–T1 responses and is not included in the flowchart Fig. 1. T0 took place in connection to referral, prior to a waiting period that averaged 8 weeks.

Written parental consent forms were obtained by clinicians after distribution of written information and invitation. Questionnaires were distributed by clinicians and returned to research assistants at the family clinics in sealed envelopes.

Demographic information is shown in Table 1. The referred children had already received community services for an average ($\pm$ standard deviation) of 3.9 ± 2.2 years (range 0.5–10 years) prior to receiving services in outpatient child psychiatric clinics for an average of

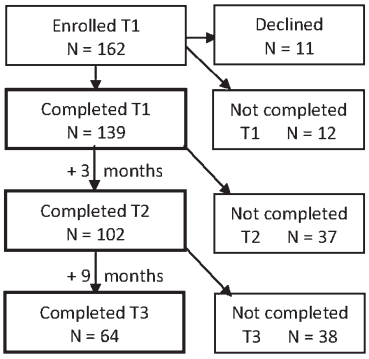

Fig. 1. Participant flowchart T1–T2–T3.

Table 1. Demographics of clinic and community parents and their children.

	Clinic parents (T1–T2) $n = 102$	Community parents, $n = 439$
Parental gender		
Mothers	65% ($n = 66$)	59% ($n = 257$)
Fathers	35% ($n = 36$)	41% ($n = 182$)
Parental age		
Mean (*s*)	39.6 (7.4)	40.6 (5.6)
Mothers	38.7 (7.1)	39.5 (5.2)
Fathers	41.6 (7.8)	42.0 (5.7)
Child's gender*		
Boys	67%	55%
Girls	33%	45%
Child's age		
Mean (*s*)	10.8 (2.7)	11.4 (2.9)
Range (years)	7–15	8–15
Offspring number, Mean (*s*)	2.8 (1.1)	2.6 (0.9)

s, standard deviation.
*Only the child gender balance was significantly different between the samples.

1.8 ± 1.8 years (range 0.5–10 years). Their total service history was thus, on average, 5.8 ± 2.9 years (range 1–12 years) before referral to the family clinic. On the Child Behaviour Checklist, the sample mean scores at referral for each problem subscale were in the moderate clinical range (T-score mean = 68.7 ± 8.1) for all subscales.

Clinical service and diagnostic evaluation

The family clinics admit families for a 2–4-week stay. Each family member participates in a concentrated full day schedule, including assessment of the child and treatment for the child and family (9, 18). Standardized child assessment instruments are used, while the treatment programmes are non-standardized, non-manualized and eclectic in their nature, which is representative of "treatment-as usual" in child psychiatry in Norway. Parents' emotional distress or other psychiatric symptoms were not specifically targeted in the assessment or treatment. Families offered this service represent approximately 1% of the cases referred to child psychiatric treatments facilities in the area. Clinicians tend to refer families to this service when family members have lasting and/or multiple difficulties within somatic, addiction, marital, social and economic areas in addition to psychiatric problems.

Because of differences in clinical routines not influenced by this study, only two of the three family clinics obtained diagnoses for children according to clinical assessments based on ICD-10 criteria: grouped in the following five broad, non-exclusive categories: 1) emotional disorders (F30–42, F50, F92–94), $n = 32$; 2) attention disorders (F90), $n = 31$; 3) learning and developmental disabilities (F70–89), $n = 27$; 4) conduct disorders (F91–92), $n = 12$; 5) trauma-related disorders (F43-44), $n = 8$. In total, 26% of the children were assigned to two of these categories (comorbidity).

Community parent sample

The community parent sample was included to represent standards regarding parenting dimensions and distress symptoms. Community parents were invited to participate from 20 public schools, of which 12 schools enlisted 606 eligible parents for the study. Teachers distributed the questionnaires to children in sealed envelopes to be taken home and completed by their parents. The questionnaires were then returned by mail to the principal investigator, and 439 parents responded, 73% of those enlisted. The recruitment area overlapped largely with the catchment area for the inpatient family clinics, a summary of the community parent demographics is shown in Table 1, and in previous research (15).

Methods

Instruments

Parenting dimensions were measured with the Parental Bonding Instrument (PBI) as revised by Kendler (11) based on an original version from Parker et al. (12), including the dimensions of Warmth (seven items) about positive emotions and empathic communication, Protectiveness (five items) tapping infantilization and monitoring and Authoritarianism (four items) concerning constraints on the child's freedom and autonomous choices. Kendler's revision of the original PBI (12) also included a version for self-reported *current parenting* practices toward offspring, which was used in this study based on approved item translations (12, 19).

Anxiety and depression symptoms were measured with the Hospital Anxiety and Depression Scales (HADS) (17, 20). HADS produces separate scores for anxiety (seven items) and depression (seven items). A score of 8 has been used in several previous studies as a minimum cut-off for clinical levels of symptoms (20), and the rate of this is used here only for descriptive purposes. Detailed accounts of psychometric properties can be found elsewhere (21). The concepts of anxiety and depression as used in this paper refer to symptoms and symptom levels and not to diagnostic categories.

Child problems as described by parents were measured by the Child Behaviour Checklist (CBCL) problem scales, Norwegian version (22), consisting of 120 items forming eight subscales and the subtotals of the Internalizing Problems scale and Externalizing Problems scale. The CBCL is part of a broader multi-informant assessment battery of competencies and emotional/behavioural problems, the Achenbach System of Empirically Based Assessment (ASEBA) (23).

Statistics

All analyses were done in SPSS 17.0 unless otherwise specified. All variables were converted to *z*-scores relative to gender, based on the community sample (mean = 0.0 ± 1.0) to allow direct comparison of differences and levels in a common metric. A *z*-score of -1.0 based on the Warmth subscale was used as the criterion for "low warmth" for illustrative purposes.

Change over time in the clinic sample for continuous variables was tested using GLM (General Linear Models) repeated measurements. Because of a small T0 sample and T3 drop-out, T0–T1 and T2–T3 longitudinal differences were analysed separately from T1–T2. Measurements were not repeated with community parents. Gender differences and differences between clinic parents and community parents for continuous variables are reported from two-way gender × sample analysis of variance (ANOVA) GLM models.

Associations between continuous variables were analysed with Pearson's product-moment correlations in SPSS 17.0. Owing to the high number of tests for demographic variable correlations to parenting and to the levels and changes in parental emotional problems (> 100), the threshold for statistical significance of these values was set at $P < 0.01$.

Because of the existence of non-exclusive categories (comorbidity), parents of children in different diagnostic groups could not be directly compared, but parents in each of these diagnostic categories could be compared with community parents. The low number of subjects in two diagnostic groups (conduct disorders and trauma-related disorders) and T2–T3 drop-out limited the statistical power for some comparisons, especially those related to T3.

Multilevel analyses were not required in this study because emotional problems and parenting were not significantly different between the sampling clusters for clinic parents (clinics) or for community parents (schools) and were not correlated between mothers and fathers within families.

Results

With the exception of parent gender proportions, there were no significant differences between the clinic and community parents with regard to demographic information (Table 1). There were no significant T1 differences in demographic, parenting or emotional variables between participants and drop-outs at T2 or T3, or between T0 participants and those *not* invited for T0 measurements.

Parental emotional problems before and after treatment

Anxiety and depressive symptoms among clinic mothers but not fathers were significantly reduced from T1 to T2 and remained lower at T3. For both anxiety and depression, *clinic mothers* but not fathers, scored higher than community parents at all four points T0–T1–T2–T3 from referral to 12-month follow-up. These differences between clinic and community parents did not depend on child diagnostic groups. Details of these statistical analyses are presented in Table 2. Levels and changes between T1–T2 are illustrated in Fig. 2.

Illustrating these mean score changes by corresponding prevalence rate changes, showed that clinical level anxiety symptoms among clinic mothers decreased from 66% at T1 to 50% at T2 and then 45% at T3, compared

Table 2. Differences in anxiety, depression and parenting warmth in clinic parents over time, and contrasted to community parent standards.

Mothers only	T0	T1	T2	T3
Anxiety				
Contrast clinic/community	Mean = 1.30*z*, $F(1,261) = 9.42^{**}$	Mean = 1.12*z*, $F(1,318) = 55.33^{**}$	Mean = 0.66*z*, $F(1,316) = 17.87^{**}$	Mean = 0.57*z*, $F(1,293) = 10.16^{**}$
Clinic change relative to T1	*ns*	–	$\Delta M_{1-2} = -0.46z$; $F_{1-2}(1,58) = 16.34^{**}$	$\Delta M_{1-2} = -0.72z$; $F_{1-3}(1,36) = 23.97^{**}$
Depression				
Contrast clinic/community	Mean = 1.22*z*, $F(1,262) = 10.13^{**}$	Mean = 1.07*z*, $F(1,318) = 49.58^{**}$	Mean = 0.51*z*, $F(1,316) = 11.02^{**}$	Mean = 0.68*z*, $F(1,293) = 12.56^{**}$
Clinic change relative to T1	*ns*	–	$\Delta M_{1-2} = -0.59z$; $F(1,58) = 16.34^{**}$	$\Delta M_{1-2} = -0.74z$; $F(1,36) = 15.45^{**}$
All parents	**T0**	**T1**	**T2**	**T3**
Warmth				
Contrast clinic/community	Mean = $-1.30z$, $F(1,448) = 13.54^{**}$	Mean = $-0.90z$, $F(1,522) = 18.04^{**}$	Mean = $-0.46z$, $F(1,522) = 9.93^{**}$	Mean = $-0.42z$, $F(1,489) = 8.21^{**}$

Only significant differences or changes have been included, based on analysis of variance. No significant differences or changes among fathers.
$^{**}P < 0.005$, $^{*}P < 0.05$, T0 = Referral, T1 = admission, T2 = 3-month follow-up, T3 = 12-month follow-up, ΔM_{1-2} = Mean change T1–T2.

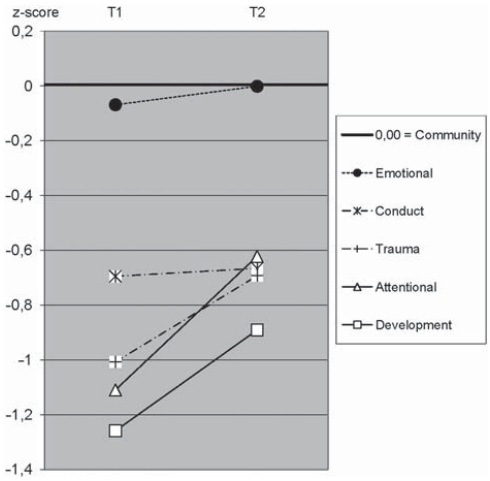

Fig. 2. Parental differences between T1 admission and T2 3-month follow-up using PBI Parenting Warmth scores within non-exclusive child diagnostic groups. Solid lines indicate: 1) a significant T1–T2 difference and 2) a significant deviations in level from the community sample. Broken lines indicate: 1) a non-significant T1–T2 difference and 2) a significant level of deviation from community parents. Dotted lines indicate: 1) a non-significant T1–T2 difference and 2) non-significant deviations in level from the community sample.

with the 19% standard rate in the community sample. The prevalence of clinical-level depression symptoms among clinic mothers decreased from 44% at T1 to 16% at T2 and 24% at T3, as compared with 6% in the community sample.

Parenting dimensions before and after treatment

Change from T1 to T2 and level *at* T1 and T2 of Warmth differed among clinic parents relative to child clinical diagnoses. Because of the small number of participants in several diagnostic subgroups, T0 and T3 were not analysed when separating parents by child diagnostic category.

Parents of children with learning and developmental disabilities and parents of children with attention disorders showed significantly increased Warmth from T1 to T2. Parents of children with conduct disorders and posttraumatic problems did not exhibit significant change in parenting from T1 to T2; however, these groups were small ($n = 12$ and $n = 8$, respectively), and thus the power to detect or reject changes in Warmth was not sufficient.

Parents of children with learning and developmental disabilities and parents of children with attention disorders showed lower Warmth levels than community parent standards at both T1 and T2 despite the improvements. Parents of emotionally troubled children did not change their Warmth level significantly across T1–T2, and did not differ from community parents at either T1 or T2.

Protectiveness did not change significantly across T1–T2, but showed significantly lower scores compared with community parents only among parents of children with emotional problems at both T1 and T2. Authoritarianism did not change significantly across T1–T2, but showed significantly higher scores only among parents of children with learning problems at T2 and among parents of children with attention disorders at both T1 and T2. Details of these analyses are shown in Table 3, and the main results are illustrated in Fig. 3.

Correlations of changes in clinic parents' emotional distress and parenting

The levels and changes of parenting dimensions or of emotional distress symptoms during any period were not statistically associated with gender or demographic information for parents or children.

The analyses of associations between change in emotional distress and change and level of parenting dimension showed that reduction in parental depression across T1–T2 correlated with increased Warmth from T1 to T2 ($r_{1-2} = 0.32$, $P < 0.01$), but not in the other two parenting dimensions. Parental anxiety reduction across T1–T2 correlated with lowered Protectiveness ($r_{1-2} = 0.29$, $P < 0.01$). In agreement with this result, depression scores correlated negatively with Warmth at both T1 and T2 measurement points ($r_1 = -0.23$ and $r_2 = -0.30$, $P < 0.01$), and anxiety correlated positively with Protectiveness at T2 ($r_2 = 0.33$, $P < 0.01$).

Reduction in maternal Anxiety, but not Depression, from T1 to T2 showed positive correlations with improved scores on both the CBCL Child Externalizing and Internalizing Problems subtotal scales T1–T2 ($r_i = 0.33$, $P < 0.05$ and $r_x = 0.44$, $P < 0.01$).

Discussion

The aim of the present study was to examine changes in parenting and symptoms of parental emotional distress across periods related to treatment in child psychiatric family clinics. There was a significant reduction in maternal distress symptoms after child "treatment-as-usual". This lower level of distress was maintained during the 3-12-month follow-up interval, but was still significantly higher than community parent standards. Parental warmth improved significantly among parents of children with learning and developmental disabilities and attention disorders after treatment, but was still significantly lower than among community parents at follow-up. In contrast, parents of children with emotional disorders showed no change, and had similar warmth and lower levels of protectiveness compared with community parents. Increase

Table 3. Differences in parenting dimensions in clinic parents over time and contrasted to community parent standards, according to clinical child diagnoses.

	PBI Parenting Warmth			
	T1 and T2 clinic parents	Change in clinic parents		
Child clinical diagnoses	Contrasted to community parents	T0–T1	T1–T2	T2–T3
Emotional disorders	$M_1 = -0.07$ ns; $M_2 = 0.00$ ns	ns	ns	ns
Attention disorders	$M_1 = -1.11$, $F(1,458) = 28.55^{**}$; $M_2 = -0.62$, $F(1,458) = 9.57^{**}$	ns	$\Delta M_{1-2} = 0.40$, $F(1,22) = 16.38^{**}$	ns
Learning/develop-mental disorders	$M_1 = -1.26$, $F(1,454) = 27.80^{**}$; $M_2 = -0.89$, $F(1,454) = 14.32^{*}$	ns	$\Delta M_{1-2} = 0.37$, $F(1,63) = 5.69^{*}$	ns
Conduct disorders	$M_1 = -0.69$, $F(1,446) = 5.08^{*}$; $M_2 = -0.67$, $F(1,446) = 4.73^{*}$	ns	ns	ns
Post-traumatic problems	$M_1 = -1.01$, $F(1,443) = 7.68^{*}$; $M_2 = -0.69$, $F(1,443) = 3.72^{*}$	ns	ns	ns
	PBI Protectiveness			
Emotional disorders	$M_1 = -0.38$, $F(1,463) = 3.86^{*}$; $M_2 = -0.42$, $F(1,463) = 4.68^{*}$	ns	ns	ns
All other disorders	$M_1 = -0.09$ ns; $M_2 = -0.20$ ns	ns	ns	ns
	PBI Authoritarianism			
Attention disorders	$M_1 = 0.94$, $F(1,460) = 19.23^{**:}$ $M_2 = 0.62$, $F(1,460) = 8.44^{**}$	ns	ns	ns
Learning/develop-mental disorders	T1 ns; $M_2 = 0.51$, $F(1,455) = 4.59^{*}$	ns	ns	ns
Other disorders	$M_1 = 0.15$ ns; $M_2 = 0.24$ ns	ns	ns	ns

Only significant differences or changes have been included, based on –3. $^{**}P < 0.005$, $^{*}P < 0.05$. T1 = admission, T2 = 3-month follow-up, M_1 = Mean T1, M_2 = Mean T2, ΔM_{1-2} = Mean change T1–T2.

in parental warmth and improved depression was associated, and so was reduced parental protectiveness and improved anxiety. The reduction in parental anxiety was correlated with reductions in parental accounts of child problems across the treatment period, but the reduction in parental depressive symptoms were not.

Parental emotional distress

The subsequent improvement in distress symptom after treatment suggests that child problems or parental perceptions of child problems may have an important influence on the parents' symptoms, because the problems as well as the perceptions of them may have changed during treatment, but likely changed little during the waiting period. The association between the reduction in maternal anxiety and lower child problem scores supports this interpretation. However, lower parental anxiety may also result in a more positive evaluation of child problems.

The significant change in maternal anxiety and depressive symptoms across the treatment period can be interpreted in several ways. The admission of the family into the inpatient clinic could have represented a situational stress that increased symptoms at T1, or a relief that the waiting period had finally ended. However, the consistent level of distress symptoms between the time of referral and admission (T0–T1) suggests that such situational factors cannot explain the distress symptom levels at admission (T1).

The consistently elevated symptom levels compared with community parents at all measurement points suggest that parental problems and disorders at clinical or subclinical levels may explain some of their distress symptom levels. The pre-treatment symptom rates in the present sample were 1.5 and 2.4 times higher than those reported for mothers of paediatric diabetes patients (also using HADS) (24). Even at the follow-ups, the rates of anxiety and depressive symptoms in the current study were two and four times that of community parents. The increased maternal psychiatric vulnerability and morbidity indicated by these results could represent a pathogenic factor for the child, but may also reflect genetic or situational risk factors shared by parent and child (25).

Parenting within child diagnostic groups before and after child treatment

The results suggest that the child's diagnostic category was an important moderator of the change and level of parenting dimensions. The unchanging and "normal" levels of parental warmth and the lower score on protectiveness among parents of emotionally disturbed children are in contrast to previous studies that reported *lower* warmth and *higher* protectiveness and/or authoritarianism among these parents (14). A possible explanation for this atypical result is that the families in the current study had a prolonged clinical history that included community and

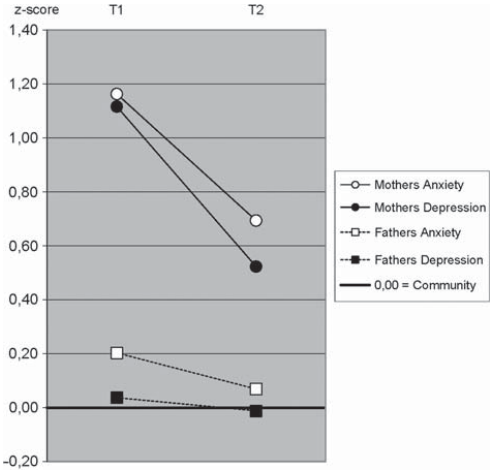

Fig. 3. Parental differences between T1 admission and T2 3-month follow-up using HADS Anxiety and Depression scores. Solid lines indicate: 1) significant T1–T2 difference and 2) significant deviations in level from the community sample. Dotted lines also indicate: 1) a non-significant T1–T2 difference and 2) non-significant deviations in level from the community sample.

outpatient interventions. Parents of children with internalized problems may have gained a greater benefit more from these interventions than those of children with other problems. In addition, internalized problems are known to represent less parental burden (4), although any child disorder may challenge parental care and require increased levels of protection and/or authority (8).

A significant increase in parental warmth after treatment was shown among parents of children with developmental and attention disorders (disorders for which parental warmth is an unlikely pathogenic factor). The low parental warmth in most diagnostic groups before treatment may have resulted partly from the long-term burden of care and worries about the troubled child. The subsequent increase in warmth after treatment may have arose from improved parental hope and understanding, and diminished concerns and daily strains, although no association between child improvement and increased warmth was found.

Low warmth may still have preceded and contributed to functional impairment and the development of secondary problems even among children with these disorders (10, 26); however, the finding of increased warmth after treatment does not correspond with this assumption. Nevertheless, even the parent groups that showed improvement still displayed significantly less warmth than community parents at the follow-ups, suggesting that low parental warmth is not merely a result of child problems. Parental characteristics that might contribute to lower warmth in the parent–child relationship include personality traits, mental health problems and attachment insecurity (8, 25), all of which are known to increase the general risk of child maladjustment (14).

According to previous research, low parental warmth is most likely to have contributed to the development of child conduct disorders (10). The child conduct disorder group demonstrated low warmth before treatment and no indication of improvement after treatment. This is consistent with previous research that shows that child psychiatric "treatment-as-usual" is unlikely to significantly change parent or child behaviour in families with conduct disorders (10).

Strengths and limitations

Comparison of the clinic samples of parents with a representative community sample, and the repeated evaluations of clinic samples recruited at three different family clinics, are strengths of this study. The clinic parent sample, however, was highly selected for children who had received many years of service prior to enrolment in the family clinics. Thus, these parents are not representative of child psychiatric clinic parents in general, but they do represent unsuccessfully treated cases. Such cases are routinely encountered in clinics but are very rarely the focus of research.

The group mean results may conceal subgroup variation and individual patterns that the present design and analytic strategy could not detect.

The use of clinical diagnoses limits the reliability of classification. The small size of some diagnostic groups is a consequence of the naturalistic design and impedes some statistical comparisons. Furthermore, the relatively low prevalence of comorbidity can be questioned in this sample, where considerable severity and chronicity of the children's problems should be expected. The small T0 sample and the T3 drop-outs threatened the power of our statistics to evaluate these two measurement points properly; however, there were no signs of systematic selection at T0 and T3, and the T0–T1 and T2–T3 differences were not only statistically non-significant but also quite small, supporting a no-change interpretation despite small samples.

Implications

Interpretations and implications must be drawn with caution from a naturalistic study. However, from a community health perspective, the lower parental warmth and heightened levels of maternal distress may reflect a major burden for the parents of children with psychiatric problem and a prognostic risk for their children. Parental emotional distress may affect the validity of child assessment (27) and treatment prognosis (28) and may contribute to parenting problems (29, 30). Thus, parental distress and reduced warmth could prolong a child's problems in spite of effective individual treatment.

Our results motivate routine evaluation and monitoring of parental emotional distress and parenting dimen-

sions when assessing and treating child psychiatric problems. This study did not intend to test treatment effects or infer causality, and parents who showed a positive change related to the treatment period could have been influenced by circumstances or events outside of the clinical setting and the treatment programme. Notably, the improvement in maternal distress and parental warmth appeared during a child- and family-oriented treatment that did not systematically address parental distress and parenting as part of the "treatment-as-usual" clinical services. Yet, family communication and mutual understanding were treatment components. Improvements were observed in this study despite exceptionally long histories of severe problems for the child.

Further research should investigate whether implementation of specific and systematic treatment components that focus on parents' emotional distress and parenting problems specifically related to child diagnoses may contribute to beneficial outcomes for parents as well as children.

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Appendix

HADS

Her kommer noen flere spørsmål om hvorledes du føler deg. For hvert spørsmål setter du kryss for ett av de fire svarene som best beskriver dine følelser ***den siste uka.*** *Ikke tenk for lenge på svaret – de spontane svarene er best.*

Jeg føler meg nervøs og urolig (Bare ett kryss)

- ☐ Mesteparten av tiden
- ☐ Mye av tiden
- ☐ Fra tid til annen
- ☐ Ikke i det hele tatt

Jeg kan le og se det morsomme i situasjoner (Bare ett kryss)

- ☐ Like mye nå som før
- ☐ Ikke like mye nå som før
- ☐ Avgjort ikke som før
- ☐ Ikke i det hele tatt

Jeg gleder meg fortsatt over ting slik jeg pleide før (Bare ett kryss)

- ☐ Avgjort like mye
- ☐ Ikke fullt så mye
- ☐ Bare lite grann
- ☐ Ikke i det hele tatt

Jeg har hodet fullt av bekymringer (Bare ett kryss)

- ☐ Veldig ofte
- ☐ Ganske ofte
- ☐ Av og til
- ☐ En gang i blant

Jeg har en urofølelse som om noe forferdelig vil skje (Bare ett kryss)

- ☐ Ja, og noe svært ille
- ☐ Ja, ikke så veldig ille
- ☐ Litt, bekymrer meg lite
- ☐ Ikke i det hele tatt

Jeg er i godt humør (Bare ett kryss)

- ☐ Aldri
- ☐ Noen ganger
- ☐ Ganske ofte
- ☐ For det meste

Jeg kan sitte i fred og ro og kjenne meg avslappet (Bare ett kryss)

- ☐ Ja, helt klart
- ☐ Vanligvis
- ☐ Ikke så ofte
- ☐ Ikke i det hele tatt

Jeg ser med glede frem til hendelser og ting (Bare ett kryss)

- ☐ Like mye som før
- ☐ Heller mindre enn før
- ☐ Avgjort mindre enn før
- ☐ Nesten ikke i det hele tatt

Jeg føler meg som om alt går langsommere (Bare ett kryss)

- ☐ Nesten hele tiden
- ☐ Svært ofte
- ☐ Fra tid til annen
- ☐ Ikke i det hele tatt

Jeg kan plutselig få en følelse av panikk (Bare ett kryss)

- ☐ Ofte
- ☐ Fra tid til annen
- ☐ Ikke så ofte
- ☐ Svært sjelden

Jeg føler meg urolig som om jeg har sommerfugler i magen (Bare ett kryss)

- ☐ Ikke i det hele tatt
- ☐ Fra tid til annen
- ☐ Ganske ofte
- ☐ Svært ofte

Jeg kan glede meg over gode bøker, radio og TV (Bare ett kryss)

- ☐ Avgjort like mye
- ☐ Ikke fullt så mye
- ☐ Bare lite grann
- ☐ Ikke i det hele tatt

Jeg bryr meg ikke lenger om hvordan jeg ser ut (Bare ett kryss)

- ☐ Ja, har sluttet å bry meg
- ☐ Ikke som jeg burde
- ☐ Kan hende ikke nok
- ☐ Bryr meg som før

Jeg er rastløs som om jeg stadig må være aktiv (Bare ett kryss)

- ☐ Uten tvil svært mye
- ☐ Ganske mye
- ☐ Ikke så veldig mye
- ☐ Ikke i det hele tatt

Mitt barn og meg (PBI-PCh).

Instruks: Nedenfor følger en del utsagn. De beskriver ulike væremåter foreldre kan ha til sine barn. Tenk på barnet ditt som er henvist til poliklinikken. Vennligst merk av nedenfor hva som er typisk for ditt forhold til barnet. Det finnes ingen riktige eller gale svar. Se nedenfor hva de enkelte tallene står for. Etterhvet spørsmål setter du en ring rundt det tallet som passer for deg.

Skala: **1= Stemmer svært godt**
2= Stemmer godt
3= Stemmer dårlig
4= Stemmer svært dårlig

1. Snakker til han/henne med varm og vennlig stemme	1	2	3	4
2. Hjelper han/ henne når hun trenger det	1	2	3	4
3. Lar han/henne gjøre det han/ hun har lyst til	1	2	3	4
4. Forholdet mellom oss er følelsesmessig fjernt	1	2	3	4
5. Forstår hennes/ hans problemer og bekymringer	1	2	3	4
6. Er kjærlige mot han/ henne	1	2	3	4
7. Liker at hun / han tar sine egne beslutninger	1	2	3	4
8. Vil ikke at hun/ han skal bli voksen	1	2	3	4
9. Forsøker å kontrollere alt hun/ han gjør	1	2	3	4
10. Blander meg opp i privatlivet hans/ hennes	1	2	3	4
11. Liker å prate med henne/ ham om forskjellige ting	1	2	3	4
12. Smiler ofte til henne/ ham	1	2	3	4
13. Har tendens til å behandle henne/ ham som om hun/ han var langt yngre	1	2	3	4
14. Oppfatter ikke hans/ hennes behov eller ønsker	1	2	3	4
15. Lar henne/ ham få avgjøre ting på egen hånd	1	2	3	4
16. Får han/ henne til å føle seg uønsket	1	2	3	4
17. Kan få henne /ham til å kjenne seg bedre når hun/ han er fortvilet eller sint	1	2	3	4
18. Prater ikke særlig mye med henne/ ham	1	2	3	4
19. Prøver å gjøre henne/ ham avhengig av meg	1	2	3	4
20. Tror ikke han/ hun klarer seg hvis jeg er ikke er i nærheten	1	2	3	4
21. Gir henne/ ham den frihet hun/ han ønsker	1	2	3	4
22. Lar han/ henne gå ut så ofte som han/ hun har lyst	1	2	3	4
23. Overbeskytter henne/ ham	1	2	3	4
24. Roser han/ henne sjelden	1	2	3	4
25. Lar henne/ ham kle seg akkurat slik hun/ han vil	1	2	3	4

Mine foreldre og meg (PBI-M/F)

Instruks: Nedenfor følger en del utsagn. De beskriver ulike væremåter foreldre kan ha til sine barn. Vennligst merk av nedenfor hva du husker var typisk for din mor og din far de 16 første årene av ditt liv.

Se nedenfor ift hva de enkelte tallene står for. Etter hvert spørsmål setter du en ring rundt det tallet som passet best for din mor, deretter setter du en ring rundt det tallet som passet best for din far.

Skala: **1= Stemmer svært godt**
2= Stemmer godt
3= Stemmer dårlig
4= Stemmer svært dårlig

	Mor				Far			
1. Snakket til meg med varm og vennlig stemme	1	2	3	4	1	2	3	4
2. Hjalp meg ikke når jeg trengte det.	1	2	3	4	1	2	3	4
3. Lot meg gjøre det jeg hadde lyst til.	1	2	3	4	1	2	3	4
4. Virket følelsesmessig kald i forhold til meg	1	2	3	4	1	2	3	4
5. Så ut til å forstå mine problemer og bekymringer	1	2	3	4	1	2	3	4
6. Var kjærlige mot meg	1	2	3	4	1	2	3	4
7. Likta at jeg tok mine egne avgjørelser	1	2	3	4	1	2	3	4
8. Ville ikke at jeg skulle bli voksen	1	2	3	4	1	2	3	4
9. Forsøkte å kontrollere alt jeg gjorde	1	2	3	4	1	2	3	4
10. Blandet seg opp i privatlivet mitt	1	2	3	4	1	2	3	4
11. Likte å prate med meg om forskjellige ting	1	2	3	4	1	2	3	4
12. Smilte ofte til meg	1	2	3	4	1	2	3	4
13. Hadde lett for å behandle meg som om jeg var langt yngre	1	2	3	4	1	2	3	4
14. Oppfattet ikke mine behov eller ønsker	1	2	3	4	1	2	3	4
15. Lot meg få avgjøre ting på egen hånd	1	2	3	4	1	2	3	4
16. Fikk meg til å føle meg uønsket	1	2	3	4	1	2	3	4
17. Fikk meg til å føle meg bedre når jeg var sint eller fortvilet	1	2	3	4	1	2	3	4
18. Pratet ikke særlig mye med meg	1	2	3	4	1	2	3	4
19. Prøvde å gjøre meg avhengig av henne/ ham	1	2	3	4	1	2	3	4
20. Trodde ikke jeg kunne klart meg hvis han eller hun ikke var i nærheten	1	2	3	4	1	2	3	4
21. Gav meg den frihet jeg ønsket	1	2	3	4	1	2	3	4
22. Lot meg gå ut så ofte jeg hadde lyst	1	2	3	4	1	2	3	4
23. Overbeskyttet meg	1	2	3	4	1	2	3	4
24. Roste meg ikke	1	2	3	4	1	2	3	4
25 Lot meg kle meg akkurat slik jeg ville	1	2	3	4	1	2	3	4

Dissertations at the Faculty of Medicine, NTNU

1977

1. Knut Joachim Berg: EFFECT OF ACETYLSALICYLIC ACID ON RENAL FUNCTION
2. Karl Erik Viken and Arne Ødegaard: STUDIES ON HUMAN MONOCYTES CULTURED *IN VITRO*

1978

3. Karel Bjørn Cyvin: CONGENITAL DISLOCATION OF THE HIP JOINT.
4. Alf O. Brubakk: METHODS FOR STUDYING FLOW DYNAMICS IN THE LEFT VENTRICLE AND THE AORTA IN MAN.

1979

5. Geirmund Unsgaard: CYTOSTATIC AND IMMUNOREGULATORY ABILITIES OF HUMAN BLOOD MONOCYTES CULTURED IN VITRO

1980

6. Størker Jørstad: URAEMIC TOXINS
7. Arne Olav Jenssen: SOME RHEOLOGICAL, CHEMICAL AND STRUCTURAL PROPERTIES OF MUCOID SPUTUM FROM PATIENTS WITH CHRONIC OBSTRUCTIVE BRONCHITIS

1981

8. Jens Hammerstrøm: CYTOSTATIC AND CYTOLYTIC ACTIVITY OF HUMAN MONOCYTES AND EFFUSION MACROPHAGES AGAINST TUMOR CELLS *IN VITRO*

1983

9. Tore Syversen: EFFECTS OF METHYLMERCURY ON RAT BRAIN PROTEIN.
10. Torbjørn Iversen: SQUAMOUS CELL CARCINOMA OF THE VULVA.

1984

11. Tor-Erik Widerøe: ASPECTS OF CONTINUOUS AMBULATORY PERITONEAL DIALYSIS.
12. Anton Hole: ALTERATIONS OF MONOCYTE AND LYMPHOCYTE FUNCTIONS IN REALTION TO SURGERY UNDER EPIDURAL OR GENERAL ANAESTHESIA.
13. Terje Terjesen: FRACTURE HEALING AND STRESS-PROTECTION AFTER METAL PLATE FIXATION AND EXTERNAL FIXATION.
14. Carsten Saunte: CLUSTER HEADACHE SYNDROME.
15. Inggard Lereim: TRAFFIC ACCIDENTS AND THEIR CONSEQUENCES.
16. Bjørn Magne Eggen: STUDIES IN CYTOTOXICITY IN HUMAN ADHERENT MONONUCLEAR BLOOD CELLS.
17. Trond Haug: FACTORS REGULATING BEHAVIORAL EFFECTS OG DRUGS.

1985

18. Sven Erik Gisvold: RESUSCITATION AFTER COMPLETE GLOBAL BRAIN ISCHEMIA.
19. Terje Espevik: THE CYTOSKELETON OF HUMAN MONOCYTES.
20. Lars Bevanger: STUDIES OF THE Ibc (c) PROTEIN ANTIGENS OF GROUP B STREPTOCOCCI.
21. Ole-Jan Iversen: RETROVIRUS-LIKE PARTICLES IN THE PATHOGENESIS OF PSORIASIS.
22. Lasse Eriksen: EVALUATION AND TREATMENT OF ALCOHOL DEPENDENT BEHAVIOUR.
23. Per I. Lundmo: ANDROGEN METABOLISM IN THE PROSTATE.

1986

24. Dagfinn Berntzen: ANALYSIS AND MANAGEMENT OF EXPERIMENTAL AND CLINICAL PAIN.
25. Odd Arnold Kildahl-Andersen: PRODUCTION AND CHARACTERIZATION OF MONOCYTE-DERIVED CYTOTOXIN AND ITS ROLE IN MONOCYTE-MEDIATED CYTOTOXICITY.
26. Ola Dale: VOLATILE ANAESTHETICS.

1987

27. Per Martin Kleveland: STUDIES ON GASTRIN.
28. Audun N. Øksendal: THE CALCIUM PARADOX AND THE HEART.
29. Vilhjalmur R. Finsen: HIP FRACTURES

1988

30. Rigmor Austgulen: TUMOR NECROSIS FACTOR: A MONOCYTE-DERIVED REGULATOR OF CELLULAR GROWTH.
31. Tom-Harald Edna: HEAD INJURIES ADMITTED TO HOSPITAL.
32. Joseph D. Borsi: NEW ASPECTS OF THE CLINICAL PHARMACOKINETICS OF METHOTREXATE.
33. Olav F. M. Sellevold: GLUCOCORTICOIDS IN MYOCARDIAL PROTECTION.
34. Terje Skjærpe: NONINVASIVE QUANTITATION OF GLOBAL PARAMETERS ON LEFT VENTRICULAR FUNCTION: THE SYSTOLIC PULMONARY ARTERY PRESSURE AND CARDIAC OUTPUT.
35. Eyvind Rødahl: STUDIES OF IMMUNE COMPLEXES AND RETROVIRUS-LIKE ANTIGENS IN PATIENTS WITH ANKYLOSING SPONDYLITIS.
36. Ketil Thorstensen: STUDIES ON THE MECHANISMS OF CELLULAR UPTAKE OF IRON FROM TRANSFERRIN.
37. Anna Midelfart: STUDIES OF THE MECHANISMS OF ION AND FLUID TRANSPORT IN THE BOVINE CORNEA.
38. Eirik Helseth: GROWTH AND PLASMINOGEN ACTIVATOR ACTIVITY OF HUMAN GLIOMAS AND BRAIN METASTASES - WITH SPECIAL REFERENCE TO TRANSFORMING GROWTH FACTOR BETA AND THE EPIDERMAL GROWTH FACTOR RECEPTOR.
39. Petter C. Borchgrevink: MAGNESIUM AND THE ISCHEMIC HEART.
40. Kjell-Arne Rein: THE EFFECT OF EXTRACORPOREAL CIRCULATION ON SUBCUTANEOUS TRANSCAPILLARY FLUID BALANCE.
41. Arne Kristian Sandvik: RAT GASTRIC HISTAMINE.
42. Carl Bredo Dahl: ANIMAL MODELS IN PSYCHIATRY.

1989

43. Torbjørn A. Fredriksen: CERVICOGENIC HEADACHE.
44. Rolf A. Walstad: CEFTAZIDIME.
45. Rolf Salvesen: THE PUPIL IN CLUSTER HEADACHE.
46. Nils Petter Jørgensen: DRUG EXPOSURE IN EARLY PREGNANCY.
47. Johan C. Ræder: PREMEDICATION AND GENERAL ANAESTHESIA IN OUTPATIENT GYNECOLOGICAL SURGERY.
48. M. R. Shalaby: IMMUNOREGULATORY PROPERTIES OF TNF-α AND THE RELATED CYTOKINES.
49. Anders Waage: THE COMPLEX PATTERN OF CYTOKINES IN SEPTIC SHOCK.
50. Bjarne Christian Eriksen: ELECTROSTIMULATION OF THE PELVIC FLOOR IN FEMALE URINARY INCONTINENCE.
51. Tore B. Halvorsen: PROGNOSTIC FACTORS IN COLORECTAL CANCER.

1990

52. Asbjørn Nordby: CELLULAR TOXICITY OF ROENTGEN CONTRAST MEDIA.
53. Kåre E. Tvedt: X-RAY MICROANALYSIS OF BIOLOGICAL MATERIAL.
54. Tore C. Stiles: COGNITIVE VULNERABILITY FACTORS IN THE DEVELOPMENT AND MAINTENANCE OF DEPRESSION.
55. Eva Hofsli: TUMOR NECROSIS FACTOR AND MULTIDRUG RESISTANCE.
56. Helge S. Haarstad: TROPHIC EFFECTS OF CHOLECYSTOKININ AND SECRETIN ON THE RAT PANCREAS.
57. Lars Engebretsen: TREATMENT OF ACUTE ANTERIOR CRUCIATE LIGAMENT INJURIES.
58. Tarjei Rygnestad: DELIBERATE SELF-POISONING IN TRONDHEIM.
59. Arne Z. Henriksen: STUDIES ON CONSERVED ANTIGENIC DOMAINS ON MAJOR OUTER MEMBRANE PROTEINS FROM ENTEROBACTERIA.
60. Steinar Westin: UNEMPLOYMENT AND HEALTH: Medical and social consequences of a factory closure in a ten-year controlled follow-up study.
61. Ylva Sahlin: INJURY REGISTRATION, a tool for accident preventive work.
62. Helge Bjørnstad Pettersen: BIOSYNTHESIS OF COMPLEMENT BY HUMAN ALVEOLAR MACROPHAGES WITH SPECIAL REFERENCE TO SARCOIDOSIS.
63. Berit Schei: TRAPPED IN PAINFUL LOVE.
64. Lars J. Vatten: PROSPECTIVE STUDIES OF THE RISK OF BREAST CANCER IN A COHORT OF NORWEGIAN WOMAN.

1991

65. Kåre Bergh: APPLICATIONS OF ANTI-C5a SPECIFIC MONOCLONAL ANTIBODIES FOR THE ASSESSMENT OF COMPLEMENT ACTIVATION.
66. Svein Svenningsen: THE CLINICAL SIGNIFICANCE OF INCREASED FEMORAL ANTEVERSION.
67. Olbjørn Klepp: NONSEMINOMATOUS GERM CELL TESTIS CANCER: THERAPEUTIC OUTCOME AND PROGNOSTIC FACTORS.
68. Trond Sand: THE EFFECTS OF CLICK POLARITY ON BRAINSTEM AUDITORY EVOKED POTENTIALS AMPLITUDE, DISPERSION, AND LATENCY VARIABLES.
69. Kjetil B. Åsbakk: STUDIES OF A PROTEIN FROM PSORIATIC SCALE, PSO P27, WITH RESPECT TO ITS POTENTIAL ROLE IN IMMUNE REACTIONS IN PSORIASIS.
70. Arnulf Hestnes: STUDIES ON DOWN´S SYNDROME.
71. Randi Nygaard: LONG-TERM SURVIVAL IN CHILDHOOD LEUKEMIA.
72. Bjørn Hagen: THIO-TEPA.
73. Svein Anda: EVALUATION OF THE HIP JOINT BY COMPUTED TOMOGRAMPHY AND ULTRASONOGRAPHY.

1992

74. Martin Svartberg: AN INVESTIGATION OF PROCESS AND OUTCOME OF SHORT-TERM PSYCHODYNAMIC PSYCHOTHERAPY.
75. Stig Arild Slørdahl: AORTIC REGURGITATION.
76. Harold C Sexton: STUDIES RELATING TO THE TREATMENT OF SYMPTOMATIC NON-PSYCHOTIC PATIENTS.
77. Maurice B. Vincent: VASOACTIVE PEPTIDES IN THE OCULAR/FOREHEAD AREA.
78. Terje Johannessen: CONTROLLED TRIALS IN SINGLE SUBJECTS.
79. Turid Nilsen: PYROPHOSPHATE IN HEPATOCYTE IRON METABOLISM.
80. Olav Haraldseth: NMR SPECTROSCOPY OF CEREBRAL ISCHEMIA AND REPERFUSION IN RAT.
81. Eiliv Brenna: REGULATION OF FUNCTION AND GROWTH OF THE OXYNTIC MUCOSA.

1993

82. Gunnar Bovim: CERVICOGENIC HEADACHE.
83. Jarl Arne Kahn: ASSISTED PROCREATION.
84. Bjørn Naume: IMMUNOREGULATORY EFFECTS OF CYTOKINES ON NK CELLS.
85. Rune Wiseth: AORTIC VALVE REPLACEMENT.
86. Jie Ming Shen: BLOOD FLOW VELOCITY AND RESPIRATORY STUDIES.
87. Piotr Kruszewski: SUNCT SYNDROME WITH SPECIAL REFERENCE TO THE AUTONOMIC NERVOUS SYSTEM.
88. Mette Haase Moen: ENDOMETRIOSIS.
89. Anne Vik: VASCULAR GAS EMBOLISM DURING AIR INFUSION AND AFTER DECOMPRESSION IN PIGS.
90. Lars Jacob Stovner: THE CHIARI TYPE I MALFORMATION.
91. Kjell Å. Salvesen: ROUTINE ULTRASONOGRAPHY IN UTERO AND DEVELOPMENT IN CHILDHOOD.

1994

92. Nina-Beate Liabakk: DEVELOPMENT OF IMMUNOASSAYS FOR TNF AND ITS SOLUBLE RECEPTORS.
93. Sverre Helge Torp: *erb*B ONCOGENES IN HUMAN GLIOMAS AND MENINGIOMAS.
94. Olav M. Linaker: MENTAL RETARDATION AND PSYCHIATRY. Past and present.
95. Per Oscar Feet: INCREASED ANTIDEPRESSANT AND ANTIPANIC EFFECT IN COMBINED TREATMENT WITH DIXYRAZINE AND TRICYCLIC ANTIDEPRESSANTS.
96. Stein Olav Samstad: CROSS SECTIONAL FLOW VELOCITY PROFILES FROM TWO-DIMENSIONAL DOPPLER ULTRASOUND: Studies on early mitral blood flow.
97. Bjørn Backe: STUDIES IN ANTENATAL CARE.
98. Gerd Inger Ringdal: QUALITY OF LIFE IN CANCER PATIENTS.
99. Torvid Kiserud: THE DUCTUS VENOSUS IN THE HUMAN FETUS.
100. Hans E. Fjøsne: HORMONAL REGULATION OF PROSTATIC METABOLISM.
101. Eylert Brodtkorb: CLINICAL ASPECTS OF EPILEPSY IN THE MENTALLY RETARDED.
102. Roar Juul: PEPTIDERGIC MECHANISMS IN HUMAN SUBARACHNOID HEMORRHAGE.
103. Unni Syversen: CHROMOGRANIN A. Phsysiological and Clinical Role.

1995

104. Odd Gunnar Brakstad: THERMOSTABLE NUCLEASE AND THE *nuc* GENE IN THE DIAGNOSIS OF *Staphylococcus aureus* INFECTIONS.
105. Terje Engan: NUCLEAR MAGNETIC RESONANCE (NMR) SPECTROSCOPY OF PLASMA IN MALIGNANT DISEASE.
106. Kirsten Rasmussen: VIOLENCE IN THE MENTALLY DISORDERED.
107. Finn Egil Skjeldestad: INDUCED ABORTION: Timetrends and Determinants.
108. Roar Stenseth: THORACIC EPIDURAL ANALGESIA IN AORTOCORONARY BYPASS SURGERY.
109. Arild Faxvaag: STUDIES OF IMMUNE CELL FUNCTION *in mice infected with* MURINE RETROVIRUS.

1996

110. Svend Aakhus: NONINVASIVE COMPUTERIZED ASSESSMENT OF LEFT VENTRICULAR FUNCTION AND SYSTEMIC ARTERIAL PROPERTIES. Methodology and some clinical applications.
111. Klaus-Dieter Bolz: INTRAVASCULAR ULTRASONOGRAPHY.
112. Petter Aadahl: CARDIOVASCULAR EFFECTS OF THORACIC AORTIC CROSS-CLAMPING.
113. Sigurd Steinshamn: CYTOKINE MEDIATORS DURING GRANULOCYTOPENIC INFECTIONS.
114. Hans Stifoss-Hanssen: SEEKING MEANING OR HAPPINESS?
115. Anne Kvikstad: LIFE CHANGE EVENTS AND MARITAL STATUS IN RELATION TO RISK AND PROGNOSIS OF CANCER.
116. Torbjørn Grøntvedt: TREATMENT OF ACUTE AND CHRONIC ANTERIOR CRUCIATE LIGAMENT INJURIES. A clinical and biomechanical study.
117. Sigrid Hørven Wigers: CLINICAL STUDIES OF FIBROMYALGIA WITH FOCUS ON ETIOLOGY, TREATMENT AND OUTCOME.
118. Jan Schjøtt: MYOCARDIAL PROTECTION: Functional and Metabolic Characteristics of Two Endogenous Protective Principles.
119. Marit Martinussen: STUDIES OF INTESTINAL BLOOD FLOW AND ITS RELATION TO TRANSITIONAL CIRCULATORY ADAPATION IN NEWBORN INFANTS.
120. Tomm B. Müller: MAGNETIC RESONANCE IMAGING IN FOCAL CEREBRAL ISCHEMIA.
121. Rune Haaverstad: OEDEMA FORMATION OF THE LOWER EXTREMITIES.
122. Magne Børset: THE ROLE OF CYTOKINES IN MULTIPLE MYELOMA, WITH SPECIAL REFERENCE TO HEPATOCYTE GROWTH FACTOR.
123. Geir Smedslund: A THEORETICAL AND EMPIRICAL INVESTIGATION OF SMOKING, STRESS AND DISEASE: RESULTS FROM A POPULATION SURVEY.

1997

124. Torstein Vik: GROWTH, MORBIDITY, AND PSYCHOMOTOR DEVELOPMENT IN INFANTS WHO WERE GROWTH RETARDED *IN UTERO*.
125. Siri Forsmo: ASPECTS AND CONSEQUENCES OF OPPORTUNISTIC SCREENING FOR CERVICAL CANCER. Results based on data from three Norwegian counties.
126. Jon S. Skranes: CEREBRAL MRI AND NEURODEVELOPMENTAL OUTCOME IN VERY LOW BIRTH WEIGHT (VLBW) CHILDREN. A follow-up study of a geographically based year cohort of VLBW children at ages one and six years.
127. Knut Bjørnstad: COMPUTERIZED ECHOCARDIOGRAPHY FOR EVALUTION OF CORONARY ARTERY DISEASE.
128. Grethe Elisabeth Borchgrevink: DIAGNOSIS AND TREATMENT OF WHIPLASH/NECK SPRAIN INJURIES CAUSED BY CAR ACCIDENTS.
129. Tor Elsås: NEUROPEPTIDES AND NITRIC OXIDE SYNTHASE IN OCULAR AUTONOMIC AND SENSORY NERVES.
130. Rolf W. Gråwe: EPIDEMIOLOGICAL AND NEUROPSYCHOLOGICAL PERSPECTIVES ON SCHIZOPHRENIA.
131. Tonje Strømholm: CEREBRAL HAEMODYNAMICS DURING THORACIC AORTIC CROSSCLAMPING. An experimental study in pigs

1998

132. Martinus Bråten: STUDIES ON SOME PROBLEMS REALTED TO INTRAMEDULLARY NAILING OF FEMORAL FRACTURES.

133. Ståle Nordgård: PROLIFERATIVE ACTIVITY AND DNA CONTENT AS PROGNOSTIC INDICATORS IN ADENOID CYSTIC CARCINOMA OF THE HEAD AND NECK.
134. Egil Lien: SOLUBLE RECEPTORS FOR **TNF** AND **LPS**: RELEASE PATTERN AND POSSIBLE SIGNIFICANCE IN DISEASE.
135. Marit Bjørgaas: HYPOGLYCAEMIA IN CHILDREN WITH DIABETES MELLITUS
136. Frank Skorpen: GENETIC AND FUNCTIONAL ANALYSES OF DNA REPAIR IN HUMAN CELLS.
137. Juan A. Pareja: SUNCT SYNDROME. ON THE CLINICAL PICTURE. ITS DISTINCTION FROM OTHER, SIMILAR HEADACHES.
138. Anders Angelsen: NEUROENDOCRINE CELLS IN HUMAN PROSTATIC CARCINOMAS AND THE PROSTATIC COMPLEX OF RAT, GUINEA PIG, CAT AND DOG.
139. Fabio Antonaci: CHRONIC PAROXYSMAL HEMICRANIA AND HEMICRANIA CONTINUA: TWO DIFFERENT ENTITIES?
140. Sven M. Carlsen: ENDOCRINE AND METABOLIC EFFECTS OF METFORMIN WITH SPECIAL EMPHASIS ON CARDIOVASCULAR RISK FACTORES.

1999

141. Terje A. Murberg: DEPRESSIVE SYMPTOMS AND COPING AMONG PATIENTS WITH CONGESTIVE HEART FAILURE.
142. Harm-Gerd Karl Blaas: THE EMBRYONIC EXAMINATION. Ultrasound studies on the development of the human embryo.
143. Noèmi Becser Andersen:THE CEPHALIC SENSORY NERVES IN UNILATERAL HEADACHES. Anatomical background and neurophysiological evaluation.
144. Eli-Janne Fiskerstrand: LASER TREATMENT OF PORT WINE STAINS. A study of the efficacy and limitations of the pulsed dye laser. Clinical and morfological analyses aimed at improving the therapeutic outcome.
145. Bård Kulseng: A STUDY OF ALGINATE CAPSULE PROPERTIES AND CYTOKINES IN RELATION TO INSULIN DEPENDENT DIABETES MELLITUS.
146. Terje Haug: STRUCTURE AND REGULATION OF THE HUMAN UNG GENE ENCODING URACIL-DNA GLYCOSYLASE.
147. Heidi Brurok: MANGANESE AND THE HEART. A Magic Metal with Diagnostic and Therapeutic Possibilites.
148. Agnes Kathrine Lie: DIAGNOSIS AND PREVALENCE OF HUMAN PAPILLOMAVIRUS INFECTION IN CERVICAL INTRAEPITELIAL NEOPLASIA. Relationship to Cell Cycle Regulatory Proteins and HLA DQBI Genes.
149. Ronald Mårvik: PHARMACOLOGICAL, PHYSIOLOGICAL AND PATHOPHYSIOLOGICAL STUDIES ON ISOLATED STOMACS.
150. Ketil Jarl Holen: THE ROLE OF ULTRASONOGRAPHY IN THE DIAGNOSIS AND TREATMENT OF HIP DYSPLASIA IN NEWBORNS.
151. Irene Hetlevik: THE ROLE OF CLINICAL GUIDELINES IN CARDIOVASCULAR RISK INTERVENTION IN GENERAL PRACTICE.
152. Katarina Tunòn: ULTRASOUND AND PREDICTION OF GESTATIONAL AGE.
153. Johannes Soma: INTERACTION BETWEEN THE LEFT VENTRICLE AND THE SYSTEMIC ARTERIES.
154. Arild Aamodt: DEVELOPMENT AND PRE-CLINICAL EVALUATION OF A CUSTOM-MADE FEMORAL STEM.
155. Agnar Tegnander: DIAGNOSIS AND FOLLOW-UP OF CHILDREN WITH SUSPECTED OR KNOWN HIP DYSPLASIA.
156. Bent Indredavik: STROKE UNIT TREATMENT: SHORT AND LONG-TERM EFFECTS
157. Jolanta Vanagaite Vingen: PHOTOPHOBIA AND PHONOPHOBIA IN PRIMARY HEADACHES

2000

158. Ola Dalsegg Sæther: PATHOPHYSIOLOGY DURING PROXIMAL AORTIC CROSS-CLAMPING CLINICAL AND EXPERIMENTAL STUDIES
159. xxxxxxxxx (blind number)
160. Christina Vogt Isaksen: PRENATAL ULTRASOUND AND POSTMORTEM FINDINGS – A TEN YEAR CORRELATIVE STUDY OF FETUSES AND INFANTS WITH DEVELOPMENTAL ANOMALIES.
161. Holger Seidel: HIGH-DOSE METHOTREXATE THERAPY IN CHILDREN WITH ACUTE LYMPHOCYTIC LEUKEMIA: DOSE, CONCENTRATION, AND EFFECT CONSIDERATIONS.

162. Stein Hallan: IMPLEMENTATION OF MODERN MEDICAL DECISION ANALYSIS INTO CLINICAL DIAGNOSIS AND TREATMENT.
163. Malcolm Sue-Chu: INVASIVE AND NON-INVASIVE STUDIES IN CROSS-COUNTRY SKIERS WITH ASTHMA-LIKE SYMPTOMS.
164. Ole-Lars Brekke: EFFECTS OF ANTIOXIDANTS AND FATTY ACIDS ON TUMOR NECROSIS FACTOR-INDUCED CYTOTOXICITY.
165. Jan Lundbom: AORTOCORONARY BYPASS SURGERY: CLINICAL ASPECTS, COST CONSIDERATIONS AND WORKING ABILITY.
166. John-Anker Zwart: LUMBAR NERVE ROOT COMPRESSION, BIOCHEMICAL AND NEUROPHYSIOLOGICAL ASPECTS.
167. Geir Falck: HYPEROSMOLALITY AND THE HEART.
168. Eirik Skogvoll: CARDIAC ARREST Incidence, Intervention and Outcome.
169. Dalius Bansevicius: SHOULDER-NECK REGION IN CERTAIN HEADACHES AND CHRONIC PAIN SYNDROMES.
170. Bettina Kinge: REFRACTIVE ERRORS AND BIOMETRIC CHANGES AMONG UNIVERSITY STUDENTS IN NORWAY.
171. Gunnar Qvigstad: CONSEQUENCES OF HYPERGASTRINEMIA IN MAN
172. Hanne Ellekjær: EPIDEMIOLOGICAL STUDIES OF STROKE IN A NORWEGIAN POPULATION. INCIDENCE, RISK FACTORS AND PROGNOSIS
173. Hilde Grimstad: VIOLENCE AGAINST WOMEN AND PREGNANCY OUTCOME.
174. Astrid Hjelde: SURFACE TENSION AND COMPLEMENT ACTIVATION: Factors influencing bubble formation and bubble effects after decompression.
175. Kjell A. Kvistad: MR IN BREAST CANCER – A CLINICAL STUDY.
176. Ivar Rossvoll: ELECTIVE ORTHOPAEDIC SURGERY IN A DEFINED POPULATION. Studies on demand, waiting time for treatment and incapacity for work.
177. Carina Seidel: PROGNOSTIC VALUE AND BIOLOGICAL EFFECTS OF HEPATOCYTE GROWTH FACTOR AND SYNDECAN-1 IN MULTIPLE MYELOMA.

2001

178. Alexander Wahba: THE INFLUENCE OF CARDIOPULMONARY BYPASS ON PLATELET FUNCTION AND BLOOD COAGULATION – DETERMINANTS AND CLINICAL CONSEQUENSES
179. Marcus Schmitt-Egenolf: THE RELEVANCE OF THE MAJOR hISTOCOMPATIBILITY COMPLEX FOR THE GENETICS OF PSORIASIS
180. Odrun Arna Gederaas: BIOLOGICAL MECHANISMS INVOLVED IN 5-AMINOLEVULINIC ACID BASED PHOTODYNAMIC THERAPY
181. Pål Richard Romundstad: CANCER INCIDENCE AMONG NORWEGIAN ALUMINIUM WORKERS
182. Henrik Hjorth-Hansen: NOVEL CYTOKINES IN GROWTH CONTROL AND BONE DISEASE OF MULTIPLE MYELOMA
183. Gunnar Morken: SEASONAL VARIATION OF HUMAN MOOD AND BEHAVIOUR
184. Bjørn Olav Haugen: MEASUREMENT OF CARDIAC OUTPUT AND STUDIES OF VELOCITY PROFILES IN AORTIC AND MITRAL FLOW USING TWO- AND THREE-DIMENSIONAL COLOUR FLOW IMAGING
185. Geir Bråthen: THE CLASSIFICATION AND CLINICAL DIAGNOSIS OF ALCOHOL-RELATED SEIZURES
186. Knut Ivar Aasarød: RENAL INVOLVEMENT IN INFLAMMATORY RHEUMATIC DISEASE. A Study of Renal Disease in Wegener's Granulomatosis and in Primary Sjögren's Syndrome
187. Trude Helen Flo: RESEPTORS INVOLVED IN CELL ACTIVATION BY DEFINED URONIC ACID POLYMERS AND BACTERIAL COMPONENTS
188. Bodil Kavli: HUMAN URACIL-DNA GLYCOSYLASES FROM THE UNG GENE: STRUCTRUAL BASIS FOR SUBSTRATE SPECIFICITY AND REPAIR
189. Liv Thommesen: MOLECULAR MECHANISMS INVOLVED IN TNF- AND GASTRIN-MEDIATED GENE REGULATION
190. Turid Lingaas Holmen: SMOKING AND HEALTH IN ADOLESCENCE; THE NORD-TRØNDELAG HEALTH STUDY, 1995-97
191. Øyvind Hjertner: MULTIPLE MYELOMA: INTERACTIONS BETWEEN MALIGNANT PLASMA CELLS AND THE BONE MICROENVIRONMENT

192. Asbjørn Støylen: STRAIN RATE IMAGING OF THE LEFT VENTRICLE BY ULTRASOUND. FEASIBILITY, CLINICAL VALIDATION AND PHYSIOLOGICAL ASPECTS
193. Kristian Midthjell: DIABETES IN ADULTS IN NORD-TRØNDELAG. PUBLIC HEALTH ASPECTS OF DIABETES MELLITUS IN A LARGE, NON-SELECTED NORWEGIAN POPULATION.
194. Guanglin Cui: FUNCTIONAL ASPECTS OF THE ECL CELL IN RODENTS
195. Ulrik Wisløff: CARDIAC EFFECTS OF AEROBIC ENDURANCE TRAINING: HYPERTROPHY, CONTRACTILITY AND CALCUIM HANDLING IN NORMAL AND FAILING HEART
196. Øyvind Halaas: MECHANISMS OF IMMUNOMODULATION AND CELL-MEDIATED CYTOTOXICITY INDUCED BY BACTERIAL PRODUCTS
197. Tore Amundsen: PERFUSION MR IMAGING IN THE DIAGNOSIS OF PULMONARY EMBOLISM
198. Nanna Kurtze: THE SIGNIFICANCE OF ANXIETY AND DEPRESSION IN FATIQUE AND PATTERNS OF PAIN AMONG INDIVIDUALS DIAGNOSED WITH FIBROMYALGIA: RELATIONS WITH QUALITY OF LIFE, FUNCTIONAL DISABILITY, LIFESTYLE, EMPLOYMENT STATUS, CO-MORBIDITY AND GENDER
199. Tom Ivar Lund Nilsen: PROSPECTIVE STUDIES OF CANCER RISK IN NORD-TRØNDELAG: THE HUNT STUDY. Associations with anthropometric, socioeconomic, and lifestyle risk factors
200. Asta Kristine Håberg: A NEW APPROACH TO THE STUDY OF MIDDLE CEREBRAL ARTERY OCCLUSION IN THE RAT USING MAGNETIC RESONANCE TECHNIQUES

2002

201. Knut Jørgen Arntzen: PREGNANCY AND CYTOKINES
202. Henrik Døllner: INFLAMMATORY MEDIATORS IN PERINATAL INFECTIONS
203. Asta Bye: LOW FAT, LOW LACTOSE DIET USED AS PROPHYLACTIC TREATMENT OF ACUTE INTESTINAL REACTIONS DURING PELVIC RADIOTHERAPY. A PROSPECTIVE RANDOMISED STUDY.
204. Sylvester Moyo: STUDIES ON STREPTOCOCCUS AGALACTIAE (GROUP B STREPTOCOCCUS) SURFACE-ANCHORED MARKERS WITH EMPHASIS ON STRAINS AND HUMAN SERA FROM ZIMBABWE.
205. Knut Hagen: HEAD-HUNT: THE EPIDEMIOLOGY OF HEADACHE IN NORD-TRØNDELAG
206. Li Lixin: ON THE REGULATION AND ROLE OF UNCOUPLING PROTEIN-2 IN INSULIN PRODUCING ß-CELLS
207. Anne Hildur Henriksen: SYMPTOMS OF ALLERGY AND ASTHMA VERSUS MARKERS OF LOWER AIRWAY INFLAMMATION AMONG ADOLESCENTS
208. Egil Andreas Fors: NON-MALIGNANT PAIN IN RELATION TO PSYCHOLOGICAL AND ENVIRONTENTAL FACTORS. EXPERIENTAL AND CLINICAL STUDES OF PAIN WITH FOCUS ON FIBROMYALGIA
209. Pål Klepstad: MORPHINE FOR CANCER PAIN
210. Ingunn Bakke: MECHANISMS AND CONSEQUENCES OF PEROXISOME PROLIFERATOR-INDUCED HYPERFUNCTION OF THE RAT GASTRIN PRODUCING CELL
211. Ingrid Susann Gribbestad: MAGNETIC RESONANCE IMAGING AND SPECTROSCOPY OF BREAST CANCER
212. Rønnaug Astri Ødegård: PREECLAMPSIA – MATERNAL RISK FACTORS AND FETAL GROWTH
213. Johan Haux: STUDIES ON CYTOTOXICITY INDUCED BY HUMAN NATURAL KILLER CELLS AND DIGITOXIN
214. Turid Suzanne Berg-Nielsen: PARENTING PRACTICES AND MENTALLY DISORDERED ADOLESCENTS
215. Astrid Rydning: BLOOD FLOW AS A PROTECTIVE FACTOR FOR THE STOMACH MUCOSA. AN EXPERIMENTAL STUDY ON THE ROLE OF MAST CELLS AND SENSORY AFFERENT NEURONS

2003

216. Jan Pål Loennechen: HEART FAILURE AFTER MYOCARDIAL INFARCTION. Regional Differences, Myocyte Function, Gene Expression, and Response to Cariporide, Losartan, and Exercise Training.

217. Elisabeth Qvigstad: EFFECTS OF FATTY ACIDS AND OVER-STIMULATION ON INSULIN SECRETION IN MAN
218. Arne Åsberg: EPIDEMIOLOGICAL STUDIES IN HEREDITARY HEMOCHROMATOSIS: PREVALENCE, MORBIDITY AND BENEFIT OF SCREENING.
219. Johan Fredrik Skomsvoll: REPRODUCTIVE OUTCOME IN WOMEN WITH RHEUMATIC DISEASE. A population registry based study of the effects of inflammatory rheumatic disease and connective tissue disease on reproductive outcome in Norwegian women in 1967-1995.
220. Siv Mørkved: URINARY INCONTINENCE DURING PREGNANCY AND AFTER DELIVERY: EFFECT OF PELVIC FLOOR MUSCLE TRAINING IN PREVENTION AND TREATMENT
221. Marit S. Jordhøy: THE IMPACT OF COMPREHENSIVE PALLIATIVE CARE
222. Tom Christian Martinsen: HYPERGASTRINEMIA AND HYPOACIDITY IN RODENTS – CAUSES AND CONSEQUENCES
223. Solveig Tingulstad: CENTRALIZATION OF PRIMARY SURGERY FOR OVARAIN CANCER. FEASIBILITY AND IMPACT ON SURVIVAL
224. Haytham Eloqayli: METABOLIC CHANGES IN THE BRAIN CAUSED BY EPILEPTIC SEIZURES
225. Torunn Bruland: STUDIES OF EARLY RETROVIRUS-HOST INTERACTIONS – VIRAL DETERMINANTS FOR PATHOGENESIS AND THE INFLUENCE OF SEX ON THE SUSCEPTIBILITY TO FRIEND MURINE LEUKAEMIA VIRUS INFECTION
226. Torstein Hole: DOPPLER ECHOCARDIOGRAPHIC EVALUATION OF LEFT VENTRICULAR FUNCTION IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION
227. Vibeke Nossum: THE EFFECT OF VASCULAR BUBBLES ON ENDOTHELIAL FUNCTION
228. Sigurd Fasting: ROUTINE BASED RECORDING OF ADVERSE EVENTS DURING ANAESTHESIA – APPLICATION IN QUALITY IMPROVEMENT AND SAFETY
229. Solfrid Romundstad: EPIDEMIOLOGICAL STUDIES OF MICROALBUMINURIA. THE NORD-TRØNDELAG HEALTH STUDY 1995-97 (HUNT 2)
230. Geir Torheim: PROCESSING OF DYNAMIC DATA SETS IN MAGNETIC RESONANCE IMAGING
231. Catrine Ahlén: SKIN INFECTIONS IN OCCUPATIONAL SATURATION DIVERS IN THE NORTH SEA AND THE IMPACT OF THE ENVIRONMENT
232. Arnulf Langhammer: RESPIRATORY SYMPTOMS, LUNG FUNCTION AND BONE MINERAL DENSITY IN A COMPREHENSIVE POPULATION SURVEY. THE NORD-TRØNDELAG HEALTH STUDY 1995-97. THE BRONCHIAL OBSTRUCTION IN NORD-TRØNDELAG STUDY
233. Einar Kjelsås: EATING DISORDERS AND PHYSICAL ACTIVITY IN NON-CLINICAL SAMPLES
234. Arne Wibe: RECTAL CANCER TREATMENT IN NORWAY – STANDARDISATION OF SURGERY AND QUALITY ASSURANCE

2004

235. Eivind Witsø: BONE GRAFT AS AN ANTIBIOTIC CARRIER
236. Anne Mari Sund: DEVELOPMENT OF DEPRESSIVE SYMPTOMS IN EARLY ADOLESCENCE
237. Hallvard Lærum: EVALUATION OF ELECTRONIC MEDICAL RECORDS – A CLINICAL TASK PERSPECTIVE
238. Gustav Mikkelsen: ACCESSIBILITY OF INFORMATION IN ELECTRONIC PATIENT RECORDS; AN EVALUATION OF THE ROLE OF DATA QUALITY
239. Steinar Krokstad: SOCIOECONOMIC INEQUALITIES IN HEALTH AND DISABILITY. SOCIAL EPIDEMIOLOGY IN THE NORD-TRØNDELAG HEALTH STUDY (HUNT), NORWAY
240. Arne Kristian Myhre: NORMAL VARIATION IN ANOGENITAL ANATOMY AND MICROBIOLOGY IN NON-ABUSED PRESCHOOL CHILDREN
241. Ingunn Dybedal: NEGATIVE REGULATORS OF HEMATOPOIETEC STEM AND PROGENITOR CELLS
242. Beate Sitter: TISSUE CHARACTERIZATION BY HIGH RESOLUTION MAGIC ANGLE SPINNING MR SPECTROSCOPY
243. Per Arne Aas: MACROMOLECULAR MAINTENANCE IN HUMAN CELLS – REPAIR OF URACIL IN DNA AND METHYLATIONS IN DNA AND RNA

244. Anna Bofin: FINE NEEDLE ASPIRATION CYTOLOGY IN THE PRIMARY INVESTIGATION OF BREAST TUMOURS AND IN THE DETERMINATION OF TREATMENT STRATEGIES
245. Jim Aage Nøttestad: DEINSTITUTIONALIZATION AND MENTAL HEALTH CHANGES AMONG PEOPLE WITH MENTAL RETARDATION
246. Reidar Fossmark: GASTRIC CANCER IN JAPANESE COTTON RATS
247. Wibeke Nordhøy: MANGANESE AND THE HEART, INTRACELLULAR MR RELAXATION AND WATER EXCHANGE ACROSS THE CARDIAC CELL MEMBRANE

2005

248. Sturla Molden: QUANTITATIVE ANALYSES OF SINGLE UNITS RECORDED FROM THE HIPPOCAMPUS AND ENTORHINAL CORTEX OF BEHAVING RATS
249. Wenche Brenne Drøyvold: EPIDEMIOLOGICAL STUDIES ON WEIGHT CHANGE AND HEALTH IN A LARGE POPULATION. THE NORD-TRØNDELAG HEALTH STUDY (HUNT)
250. Ragnhild Støen: ENDOTHELIUM-DEPENDENT VASODILATION IN THE FEMORAL ARTERY OF DEVELOPING PIGLETS
251. Aslak Steinsbekk: HOMEOPATHY IN THE PREVENTION OF UPPER RESPIRATORY TRACT INFECTIONS IN CHILDREN
252. Hill-Aina Steffenach: MEMORY IN HIPPOCAMPAL AND CORTICO-HIPPOCAMPAL CIRCUITS
253. Eystein Stordal: ASPECTS OF THE EPIDEMIOLOGY OF DEPRESSIONS BASED ON SELF-RATING IN A LARGE GENERAL HEALTH STUDY (THE HUNT-2 STUDY)
254. Viggo Pettersen: FROM MUSCLES TO SINGING: THE ACTIVITY OF ACCESSORY BREATHING MUSCLES AND THORAX MOVEMENT IN CLASSICAL SINGING
255. Marianne Fyhn: SPATIAL MAPS IN THE HIPPOCAMPUS AND ENTORHINAL CORTEX
256. Robert Valderhaug: OBSESSIVE-COMPULSIVE DISORDER AMONG CHILDREN AND ADOLESCENTS: CHARACTERISTICS AND PSYCHOLOGICAL MANAGEMENT OF PATIENTS IN OUTPATIENT PSYCHIATRIC CLINICS
257. Erik Skaaheim Haug: INFRARENAL ABDOMINAL AORTIC ANEURYSMS – COMORBIDITY AND RESULTS FOLLOWING OPEN SURGERY
258. Daniel Kondziella: GLIAL-NEURONAL INTERACTIONS IN EXPERIMENTAL BRAIN DISORDERS
259. Vegard Heimly Brun: ROUTES TO SPATIAL MEMORY IN HIPPOCAMPAL PLACE CELLS
260. Kenneth McMillan: PHYSIOLOGICAL ASSESSMENT AND TRAINING OF ENDURANCE AND STRENGTH IN PROFESSIONAL YOUTH SOCCER PLAYERS
261. Marit Sæbø Indredavik: MENTAL HEALTH AND CEREBRAL MAGNETIC RESONANCE IMAGING IN ADOLESCENTS WITH LOW BIRTH WEIGHT
262. Ole Johan Kemi: ON THE CELLULAR BASIS OF AEROBIC FITNESS, INTENSITY-DEPENDENCE AND TIME-COURSE OF CARDIOMYOCYTE AND ENDOTHELIAL ADAPTATIONS TO EXERCISE TRAINING
263. Eszter Vanky: POLYCYSTIC OVARY SYNDROME – METFORMIN TREATMENT IN PREGNANCY
264. Hild Fjærtoft: EXTENDED STROKE UNIT SERVICE AND EARLY SUPPORTED DISCHARGE. SHORT AND LONG-TERM EFFECTS
265. Grete Dyb: POSTTRAUMATIC STRESS REACTIONS IN CHILDREN AND ADOLESCENTS
266. Vidar Fykse: SOMATOSTATIN AND THE STOMACH
267. Kirsti Berg: OXIDATIVE STRESS AND THE ISCHEMIC HEART: A STUDY IN PATIENTS UNDERGOING CORONARY REVASCULARIZATION
268. Björn Inge Gustafsson: THE SEROTONIN PRODUCING ENTEROCHROMAFFIN CELL, AND EFFECTS OF HYPERSEROTONINEMIA ON HEART AND BONE

2006

269. Torstein Baade Rø: EFFECTS OF BONE MORPHOGENETIC PROTEINS, HEPATOCYTE GROWTH FACTOR AND INTERLEUKIN-21 IN MULTIPLE MYELOMA
270. May-Britt Tessem: METABOLIC EFFECTS OF ULTRAVIOLET RADIATION ON THE ANTERIOR PART OF THE EYE
271. Anne-Sofie Helvik: COPING AND EVERYDAY LIFE IN A POPULATION OF ADULTS WITH HEARING IMPAIRMENT

272. Therese Standal: MULTIPLE MYELOMA: THE INTERPLAY BETWEEN MALIGNANT PLASMA CELLS AND THE BONE MARROW MICROENVIRONMENT
273. Ingvild Saltvedt: TREATMENT OF ACUTELY SICK, FRAIL ELDERLY PATIENTS IN A GERIATRIC EVALUATION AND MANAGEMENT UNIT – RESULTS FROM A PROSPECTIVE RANDOMISED TRIAL
274. Birger Henning Endreseth: STRATEGIES IN RECTAL CANCER TREATMENT – FOCUS ON EARLY RECTAL CANCER AND THE INFLUENCE OF AGE ON PROGNOSIS
275. Anne Mari Aukan Rokstad: ALGINATE CAPSULES AS BIOREACTORS FOR CELL THERAPY
276. Mansour Akbari: HUMAN BASE EXCISION REPAIR FOR PRESERVATION OF GENOMIC STABILITY
277. Stein Sundstrøm: IMPROVING TREATMENT IN PATIENTS WITH LUNG CANCER – RESULTS FROM TWO MULITCENTRE RANDOMISED STUDIES
278. Hilde Pleym: BLEEDING AFTER CORONARY ARTERY BYPASS SURGERY - STUDIES ON HEMOSTATIC MECHANISMS, PROPHYLACTIC DRUG TREATMENT AND EFFECTS OF AUTOTRANSFUSION
279. Line Merethe Oldervoll: PHYSICAL ACTIVITY AND EXERCISE INTERVENTIONS IN CANCER PATIENTS
280. Boye Welde: THE SIGNIFICANCE OF ENDURANCE TRAINING, RESISTANCE TRAINING AND MOTIVATIONAL STYLES IN ATHLETIC PERFORMANCE AMONG ELITE JUNIOR CROSS-COUNTRY SKIERS
281. Per Olav Vandvik: IRRITABLE BOWEL SYNDROME IN NORWAY, STUDIES OF PREVALENCE, DIAGNOSIS AND CHARACTERISTICS IN GENERAL PRACTICE AND IN THE POPULATION
282. Idar Kirkeby-Garstad: CLINICAL PHYSIOLOGY OF EARLY MOBILIZATION AFTER CARDIAC SURGERY
283. Linn Getz: SUSTAINABLE AND RESPONSIBLE PREVENTIVE MEDICINE. CONCEPTUALISING ETHICAL DILEMMAS ARISING FROM CLINICAL IMPLEMENTATION OF ADVANCING MEDICAL TECHNOLOGY
284. Eva Tegnander: DETECTION OF CONGENITAL HEART DEFECTS IN A NON-SELECTED POPULATION OF 42,381 FETUSES
285. Kristin Gabestad Nørsett: GENE EXPRESSION STUDIES IN GASTROINTESTINAL PATHOPHYSIOLOGY AND NEOPLASIA
286. Per Magnus Haram: GENETIC VS. AQUIRED FITNESS: METABOLIC, VASCULAR AND CARDIOMYOCYTE ADAPTATIONS
287. Agneta Johansson: GENERAL RISK FACTORS FOR GAMBLING PROBLEMS AND THE PREVALENCE OF PATHOLOGICAL GAMBLING IN NORWAY
288. Svein Artur Jensen: THE PREVALENCE OF SYMPTOMATIC ARTERIAL DISEASE OF THE LOWER LIMB
289. Charlotte Björk Ingul: QUANITIFICATION OF REGIONAL MYOCARDIAL FUNCTION BY STRAIN RATE AND STRAIN FOR EVALUATION OF CORONARY ARTERY DISEASE. AUTOMATED VERSUS MANUAL ANALYSIS DURING ACUTE MYOCARDIAL INFARCTION AND DOBUTAMINE STRESS ECHOCARDIOGRAPHY
290. Jakob Nakling: RESULTS AND CONSEQUENCES OF ROUTINE ULTRASOUND SCREENING IN PREGNANCY – A GEOGRAPHIC BASED POPULATION STUDY
291. Anne Engum: DEPRESSION AND ANXIETY – THEIR RELATIONS TO THYROID DYSFUNCTION AND DIABETES IN A LARGE EPIDEMIOLOGICAL STUDY
292. Ottar Bjerkeset: ANXIETY AND DEPRESSION IN THE GENERAL POPULATION: RISK FACTORS, INTERVENTION AND OUTCOME – THE NORD-TRØNDELAG HEALTH STUDY (HUNT)
293. Jon Olav Drogset: RESULTS AFTER SURGICAL TREATMENT OF ANTERIOR CRUCIATE LIGAMENT INJURIES – A CLINICAL STUDY
294. Lars Fosse: MECHANICAL BEHAVIOUR OF COMPACTED MORSELLISED BONE – AN EXPERIMENTAL IN VITRO STUDY
295. Gunilla Klensmeden Fosse: MENTAL HEALTH OF PSYCHIATRIC OUTPATIENTS BULLIED IN CHILDHOOD
296. Paul Jarle Mork: MUSCLE ACTIVITY IN WORK AND LEISURE AND ITS ASSOCIATION TO MUSCULOSKELETAL PAIN

297. Björn Stenström: LESSONS FROM RODENTS: I: MECHANISMS OF OBESITY SURGERY – ROLE OF STOMACH. II: CARCINOGENIC EFFECTS OF *HELICOBACTER PYLORI* AND SNUS IN THE STOMACH

2007

298. Haakon R. Skogseth: INVASIVE PROPERTIES OF CANCER – A TREATMENT TARGET ? IN VITRO STUDIES IN HUMAN PROSTATE CANCER CELL LINES
299. Janniche Hammer: GLUTAMATE METABOLISM AND CYCLING IN MESIAL TEMPORAL LOBE EPILEPSY
300. May Britt Drugli: YOUNG CHILDREN TREATED BECAUSE OF ODD/CD: CONDUCT PROBLEMS AND SOCIAL COMPETENCIES IN DAY-CARE AND SCHOOL SETTINGS
301. Arne Skjold: MAGNETIC RESONANCE KINETICS OF MANGANESE DIPYRIDOXYL DIPHOSPHATE (MnDPDP) IN HUMAN MYOCARDIUM. STUDIES IN HEALTHY VOLUNTEERS AND IN PATIENTS WITH RECENT MYOCARDIAL INFARCTION
302. Siri Malm: LEFT VENTRICULAR SYSTOLIC FUNCTION AND MYOCARDIAL PERFUSION ASSESSED BY CONTRAST ECHOCARDIOGRAPHY
303. Valentina Maria do Rosario Cabral Iversen: MENTAL HEALTH AND PSYCHOLOGICAL ADAPTATION OF CLINICAL AND NON-CLINICAL MIGRANT GROUPS
304. Lasse Løvstakken: SIGNAL PROCESSING IN DIAGNOSTIC ULTRASOUND: ALGORITHMS FOR REAL-TIME ESTIMATION AND VISUALIZATION OF BLOOD FLOW VELOCITY
305. Elisabeth Olstad: GLUTAMATE AND GABA: MAJOR PLAYERS IN NEURONAL METABOLISM
306. Lilian Leistad: THE ROLE OF CYTOKINES AND PHOSPHOLIPASE A_2S IN ARTICULAR CARTILAGE CHONDROCYTES IN RHEUMATOID ARTHRITIS AND OSTEOARTHRITIS
307. Arne Vaaler: EFFECTS OF PSYCHIATRIC INTENSIVE CARE UNIT IN AN ACUTE PSYCIATHRIC WARD
308. Mathias Toft: GENETIC STUDIES OF LRRK2 AND PINK1 IN PARKINSON'S DISEASE
309. Ingrid Løvold Mostad: IMPACT OF DIETARY FAT QUANTITY AND QUALITY IN TYPE 2 DIABETES WITH EMPHASIS ON MARINE N-3 FATTY ACIDS
310. Torill Eidhammer Sjøbakk: MR DETERMINED BRAIN METABOLIC PATTERN IN PATIENTS WITH BRAIN METASTASES AND ADOLESCENTS WITH LOW BIRTH WEIGHT
311. Vidar Beisvåg: PHYSIOLOGICAL GENOMICS OF HEART FAILURE: FROM TECHNOLOGY TO PHYSIOLOGY
312. Olav Magnus Søndenå Fredheim: HEALTH RELATED QUALITY OF LIFE ASSESSMENT AND ASPECTS OF THE CLINICAL PHARMACOLOGY OF METHADONE IN PATIENTS WITH CHRONIC NON-MALIGNANT PAIN
313. Anne Brantberg: FETAL AND PERINATAL IMPLICATIONS OF ANOMALIES IN THE GASTROINTESTINAL TRACT AND THE ABDOMINAL WALL
314. Erik Solligård: GUT LUMINAL MICRODIALYSIS
315. Elin Tollefsen: RESPIRATORY SYMPTOMS IN A COMPREHENSIVE POPULATION BASED STUDY AMONG ADOLESCENTS 13-19 YEARS. YOUNG-HUNT 1995-97 AND 2000-01; THE NORD-TRØNDELAG HEALTH STUDIES (HUNT)
316. Anne-Tove Brenne: GROWTH REGULATION OF MYELOMA CELLS
317. Heidi Knobel: FATIGUE IN CANCER TREATMENT – ASSESSMENT, COURSE AND ETIOLOGY
318. Torbjørn Dahl: CAROTID ARTERY STENOSIS. DIAGNOSTIC AND THERAPEUTIC ASPECTS
319. Inge-Andre Rasmussen jr.: FUNCTIONAL AND DIFFUSION TENSOR MAGNETIC RESONANCE IMAGING IN NEUROSURGICAL PATIENTS
320. Grete Helen Bratberg: PUBERTAL TIMING – ANTECEDENT TO RISK OR RESILIENCE ? EPIDEMIOLOGICAL STUDIES ON GROWTH, MATURATION AND HEALTH RISK BEHAVIOURS; THE YOUNG HUNT STUDY, NORD-TRØNDELAG, NORWAY
321. Sveinung Sørhaug: THE PULMONARY NEUROENDOCRINE SYSTEM. PHYSIOLOGICAL, PATHOLOGICAL AND TUMOURIGENIC ASPECTS
322. Olav Sande Eftedal: ULTRASONIC DETECTION OF DECOMPRESSION INDUCED VASCULAR MICROBUBBLES
323. Rune Bang Leistad: PAIN, AUTONOMIC ACTIVATION AND MUSCULAR ACTIVITY RELATED TO EXPERIMENTALLY-INDUCED COGNITIVE STRESS IN HEADACHE PATIENTS

324. Svein Brekke: TECHNIQUES FOR ENHANCEMENT OF TEMPORAL RESOLUTION IN THREE-DIMENSIONAL ECHOCARDIOGRAPHY
325. Kristian Bernhard Nilsen: AUTONOMIC ACTIVATION AND MUSCLE ACTIVITY IN RELATION TO MUSCULOSKELETAL PAIN
326. Anne Irene Hagen: HEREDITARY BREAST CANCER IN NORWAY. DETECTION AND PROGNOSIS OF BREAST CANCER IN FAMILIES WITH *BRCA1*GENE MUTATION
327. Ingebjørg S. Juel : INTESTINAL INJURY AND RECOVERY AFTER ISCHEMIA. AN EXPERIMENTAL STUDY ON RESTITUTION OF THE SURFACE EPITHELIUM, INTESTINAL PERMEABILITY, AND RELEASE OF BIOMARKERS FROM THE MUCOSA
328. Runa Heimstad: POST-TERM PREGNANCY
329. Jan Egil Afset: ROLE OF ENTEROPATHOGENIC *ESCHERICHIA COLI* IN CHILDHOOD DIARRHOEA IN NORWAY
330. Bent Håvard Hellum: *IN VITRO* INTERACTIONS BETWEEN MEDICINAL DRUGS AND HERBS ON CYTOCHROME P-450 METABOLISM AND P-GLYCOPROTEIN TRANSPORT
331. Morten André Høydal: CARDIAC DYSFUNCTION AND MAXIMAL OXYGEN UPTAKE MYOCARDIAL ADAPTATION TO ENDURANCE TRAINING

2008

332. Andreas Møllerløkken: REDUCTION OF VASCULAR BUBBLES: METHODS TO PREVENT THE ADVERSE EFFECTS OF DECOMPRESSION
333. Anne Hege Aamodt: COMORBIDITY OF HEADACHE AND MIGRAINE IN THE NORD-TRØNDELAG HEALTH STUDY 1995-97
334. Brage Høyem Amundsen: MYOCARDIAL FUNCTION QUANTIFIED BY SPECKLE TRACKING AND TISSUE DOPPLER ECHOCARDIOGRAPHY – VALIDATION AND APPLICATION IN EXERCISE TESTING AND TRAINING
335. Inger Anne Næss: INCIDENCE, MORTALITY AND RISK FACTORS OF FIRST VENOUS THROMBOSIS IN A GENERAL POPULATION. RESULTS FROM THE SECOND NORD-TRØNDELAG HEALTH STUDY (HUNT2)
336. Vegard Bugten: EFFECTS OF POSTOPERATIVE MEASURES AFTER FUNCTIONAL ENDOSCOPIC SINUS SURGERY
337. Morten Bruvold: MANGANESE AND WATER IN CARDIAC MAGNETIC RESONANCE IMAGING
338. Miroslav Fris: THE EFFECT OF SINGLE AND REPEATED ULTRAVIOLET RADIATION ON THE ANTERIOR SEGMENT OF THE RABBIT EYE
339. Svein Arne Aase: METHODS FOR IMPROVING QUALITY AND EFFICIENCY IN QUANTITATIVE ECHOCARDIOGRAPHY – ASPECTS OF USING HIGH FRAME RATE
340. Roger Almvik: ASSESSING THE RISK OF VIOLENCE: DEVELOPMENT AND VALIDATION OF THE BRØSET VIOLENCE CHECKLIST
341. Ottar Sundheim: STRUCTURE-FUNCTION ANALYSIS OF HUMAN ENZYMES INITIATING NUCLEOBASE REPAIR IN DNA AND RNA
342. Anne Mari Undheim: SHORT AND LONG-TERM OUTCOME OF EMOTIONAL AND BEHAVIOURAL PROBLEMS IN YOUNG ADOLESCENTS WITH AND WITHOUT READING DIFFICULTIES
343. Helge Garåsen: THE TRONDHEIM MODEL. IMPROVING THE PROFESSIONAL COMMUNICATION BETWEEN THE VARIOUS LEVELS OF HEALTH CARE SERVICES AND IMPLEMENTATION OF INTERMEDIATE CARE AT A COMMUNITY HOSPITAL COULD PROVIDE BETTER CARE FOR OLDER PATIENTS. SHORT AND LONG TERM EFFECTS
344. Olav A. Foss: "THE ROTATION RATIOS METHOD". A METHOD TO DESCRIBE ALTERED SPATIAL ORIENTATION IN SEQUENTIAL RADIOGRAPHS FROM ONE PELVIS
345. Bjørn Olav Åsvold: THYROID FUNCTION AND CARDIOVASCULAR HEALTH
346. Torun Margareta Melø: NEURONAL GLIAL INTERACTIONS IN EPILEPSY
347. Irina Poliakova Eide: FETAL GROWTH RESTRICTION AND PRE-ECLAMPSIA: SOME CHARACTERISTICS OF FETO-MATERNAL INTERACTIONS IN DECIDUA BASALIS
348. Torunn Askim: RECOVERY AFTER STROKE. ASSESSMENT AND TREATMENT; WITH FOCUS ON MOTOR FUNCTION
349. Ann Elisabeth Åsberg: NEUTROPHIL ACTIVATION IN A ROLLER PUMP MODEL OF CARDIOPULMONARY BYPASS. INFLUENCE ON BIOMATERIAL, PLATELETS AND COMPLEMENT

350. Lars Hagen: REGULATION OF DNA BASE EXCISION REPAIR BY PROTEIN INTERACTIONS AND POST TRANSLATIONAL MODIFICATIONS
351. Sigrun Beate Kjøtrød: POLYCYSTIC OVARY SYNDROME – METFORMIN TREATMENT IN ASSISTED REPRODUCTION
352. Steven Keita Nishiyama: PERSPECTIVES ON LIMB-VASCULAR HETEROGENEITY: IMPLICATIONS FOR HUMAN AGING, SEX, AND EXERCISE
353. Sven Peter Näsholm: ULTRASOUND BEAMS FOR ENHANCED IMAGE QUALITY
354. Jon Ståle Ritland: PRIMARY OPEN-ANGLE GLAUCOMA & EXFOLIATIVE GLAUCOMA. SURVIVAL, COMORBIDITY AND GENETICS
355. Sigrid Botne Sando: ALZHEIMER'S DISEASE IN CENTRAL NORWAY. GENETIC AND EDUCATIONAL ASPECTS
356. Parvinder Kaur: CELLULAR AND MOLECULAR MECHANISMS BEHIND METHYLMERCURY-INDUCED NEUROTOXICITY
357. Ismail Cüneyt Güzey: DOPAMINE AND SEROTONIN RECEPTOR AND TRANSPORTER GENE POLYMORPHISMS AND EXTRAPYRAMIDAL SYMPTOMS. STUDIES IN PARKINSON'S DISEASE AND IN PATIENTS TREATED WITH ANTIPSYCHOTIC OR ANTIDEPRESSANT DRUGS
358. Brit Dybdahl: EXTRA-CELLULAR INDUCIBLE HEAT-SHOCK PROTEIN 70 (Hsp70) – A ROLE IN THE INFLAMMATORY RESPONSE ?
359. Kristoffer Haugarvoll: IDENTIFYING GENETIC CAUSES OF PARKINSON'S DISEASE IN NORWAY
360. Nadra Nilsen: TOLL-LIKE RECEPTOR 2 –EXPRESSION, REGULATION AND SIGNALING
361. Johan Håkon Bjørngaard: PATIENT SATISFACTION WITH OUTPATIENT MENTAL HEALTH SERVICES – THE INFLUENCE OF ORGANIZATIONAL FACTORS.
362. Kjetil Høydal : EFFECTS OF HIGH INTENSITY AEROBIC TRAINING IN HEALTHY SUBJECTS AND CORONARY ARTERY DISEASE PATIENTS; THE IMPORTANCE OF INTENSITY,, DURATION AND FREQUENCY OF TRAINING.
363. Trine Karlsen: TRAINING IS MEDICINE: ENDURANCE AND STRENGTH TRAINING IN CORONARY ARTERY DISEASE AND HEALTH.
364. Marte Thuen: MANGANASE-ENHANCED AND DIFFUSION TENSOR MR IMAGING OF THE NORMAL, INJURED AND REGENERATING RAT VISUAL PATHWAY
365. Cathrine Broberg Vågbø: DIRECT REPAIR OF ALKYLATION DAMAGE IN DNA AND RNA BY 2-OXOGLUTARATE- AND IRON-DEPENDENT DIOXYGENASES
366. Arnt Erik Tjønna: AEROBIC EXERCISE AND CARDIOVASCULAR RISK FACTORS IN OVERWEIGHT AND OBESE ADOLESCENTS AND ADULTS
367. Marianne W. Furnes: FEEDING BEHAVIOR AND BODY WEIGHT DEVELOPMENT: LESSONS FROM RATS
368. Lene N. Johannessen: FUNGAL PRODUCTS AND INFLAMMATORY RESPONSES IN HUMAN MONOCYTES AND EPITHELIAL CELLS
369. Anja Bye: GENE EXPRESSION PROFILING OF *INHERITED* AND *ACQUIRED* MAXIMAL OXYGEN UPTAKE – RELATIONS TO THE METABOLIC SYNDROME.
370. Oluf Dimitri Røe: MALIGNANT MESOTHELIOMA: VIRUS, BIOMARKERS AND GENES. A TRANSLATIONAL APPROACH
371. Ane Cecilie Dale: DIABETES MELLITUS AND FATAL ISCHEMIC HEART DISEASE. ANALYSES FROM THE HUNT1 AND 2 STUDIES
372. Jacob Christian Hølen: PAIN ASSESSMENT IN PALLIATIVE CARE: VALIDATION OF METHODS FOR SELF-REPORT AND BEHAVIOURAL ASSESSMENT
373. Erming Tian: THE GENETIC IMPACTS IN THE ONCOGENESIS OF MULTIPLE MYELOMA
374. Ole Bosnes: KLINISK UTPRØVING AV NORSKE VERSJONER AV NOEN SENTRALE TESTER PÅ KOGNITIV FUNKSJON
375. Ola M. Rygh: 3D ULTRASOUND BASED NEURONAVIGATION IN NEUROSURGERY. A CLINICAL EVALUATION
376. Astrid Kamilla Stunes: ADIPOKINES, PEROXISOME PROFILERATOR ACTIVATED RECEPTOR (PPAR) AGONISTS AND SEROTONIN. COMMON REGULATORS OF BONE AND FAT METABOLISM
377. Silje Engdal: HERBAL REMEDIES USED BY NORWEGIAN CANCER PATIENTS AND THEIR ROLE IN HERB-DRUG INTERACTIONS
378. Kristin Offerdal: IMPROVED ULTRASOUND IMAGING OF THE FETUS AND ITS CONSEQUENCES FOR SEVERE AND LESS SEVERE ANOMALIES

379. Øivind Rognmo: HIGH-INTENSITY AEROBIC EXERCISE AND CARDIOVASCULAR HEALTH
380. Jo-Åsmund Lund: RADIOTHERAPY IN ANAL CARCINOMA AND PROSTATE CANCER

2009

381. Tore Grüner Bjåstad: HIGH FRAME RATE ULTRASOUND IMAGING USING PARALLEL BEAMFORMING
382. Erik Søndenaa: INTELLECTUAL DISABILITIES IN THE CRIMINAL JUSTICE SYSTEM
383. Berit Rostad: SOCIAL INEQUALITIES IN WOMEN'S HEALTH, HUNT 1984-86 AND 1995-97, THE NORD-TRØNDELAG HEALTH STUDY (HUNT)
384. Jonas Crosby: ULTRASOUND-BASED QUANTIFICATION OF MYOCARDIAL DEFORMATION AND ROTATION
385. Erling Tronvik: MIGRAINE, BLOOD PRESSURE AND THE RENIN-ANGIOTENSIN SYSTEM
386. Tom Christensen: BRINGING THE GP TO THE FOREFRONT OF EPR DEVELOPMENT
387. Håkon Bergseng: ASPECTS OF GROUP B STREPTOCOCCUS (GBS) DISEASE IN THE NEWBORN. EPIDEMIOLOGY, CHARACTERISATION OF INVASIVE STRAINS AND EVALUATION OF INTRAPARTUM SCREENING
388. Ronny Myhre: GENETIC STUDIES OF CANDIDATE TENE3S IN PARKINSON'S DISEASE
389. Torbjørn Moe Eggebø: ULTRASOUND AND LABOUR
390. Eivind Wang: TRAINING IS MEDICINE FOR PATIENTS WITH PERIPHERAL ARTERIAL DISEASE
391. Thea Kristin Våtsveen: GENETIC ABERRATIONS IN MYELOMA CELLS
392. Thomas Jozefiak: QUALITY OF LIFE AND MENTAL HEALTH IN CHILDREN AND ADOLESCENTS: CHILD AND PARENT PERSPECTIVES
393. Jens Erik Slagsvold: N-3 POLYUNSATURATED FATTY ACIDS IN HEALTH AND DISEASE – CLINICAL AND MOLECULAR ASPECTS
394. Kristine Misund: A STUDY OF THE TRANSCRIPTIONAL REPRESSOR ICER. REGULATORY NETWORKS IN GASTRIN-INDUCED GENE EXPRESSION
395. Franco M. Impellizzeri: HIGH-INTENSITY TRAINING IN FOOTBALL PLAYERS. EFFECTS ON PHYSICAL AND TECHNICAL PERFORMANCE
396. Kari Hanne Gjeilo: HEALTH-RELATED QUALITY OF LIFE AND CHRONIC PAIN IN PATIENTS UNDERGOING CARDIAC SURGERY
397. Øyvind Hauso: NEUROENDOCRINE ASPECTS OF PHYSIOLOGY AND DISEASE
398. Ingvild Bjellmo Johnsen: INTRACELLULAR SIGNALING MECHANISMS IN THE INNATE IMMUNE RESPONSE TO VIRAL INFECTIONS
399. Linda Tømmerdal Roten: GENETIC PREDISPOSITION FOR DEVELOPMENT OF PREEMCLAMPSIA – CANDIDATE GENE STUDIES IN THE HUNT (NORD-TRØNDELAG HEALTH STUDY) POPULATION
400. Trude Teoline Nausthaug Rakvåg: PHARMACOGENETICS OF MORPHINE IN CANCER PAIN
401. Hanne Lehn: MEMORY FUNCTIONS OF THE HUMAN MEDIAL TEMPORAL LOBE STUDIED WITH fMRI
402. Randi Utne Holt: ADHESION AND MIGRATION OF MYELOMA CELLS – IN VITRO STUDIES –
403. Trygve Solstad: NEURAL REPRESENTATIONS OF EUCLIDEAN SPACE
404. Unn-Merete Fagerli: MULTIPLE MYELOMA CELLS AND CYTOKINES FROM THE BONE MARROW ENVIRONMENT; ASPECTS OF GROWTH REGULATION AND MIGRATION
405. Sigrid Bjørnelv: EATING– AND WEIGHT PROBLEMS IN ADOLESCENTS, THE YOUNG HUNT-STUDY
406. Mari Hoff: CORTICAL HAND BONE LOSS IN RHEUMATOID ARTHRITIS. EVALUATING DIGITAL X-RAY RADIOGRAMMETRY AS OUTCOME MEASURE OF DISEASE ACTIVITY, RESPONSE VARIABLE TO TREATMENT AND PREDICTOR OF BONE DAMAGE
407. Siri Bjørgen: AEROBIC HIGH INTENSITY INTERVAL TRAINING IS AN EFFECTIVE TREATMENT FOR PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE
408. Susanne Lindqvist: VISION AND BRAIN IN ADOLESCENTS WITH LOW BIRTH WEIGHT
409. Torbjørn Hergum: 3D ULTRASOUND FOR QUANTITATIVE ECHOCARDIOGRAPHY

410. Jørgen Urnes: PATIENT EDUCATION IN GASTRO-OESOPHAGEAL REFLUX DISEASE. VALIDATION OF A DIGESTIVE SYMPTOMS AND IMPACT QUESTIONNAIRE AND A RANDOMISED CONTROLLED TRIAL OF PATIENT EDUCATION
411. Elvar Eyjolfsson: 13C NMRS OF ANIMAL MODELS OF SCHIZOPHRENIA
412. Marius Steiro Fimland: CHRONIC AND ACUTE NEURAL ADAPTATIONS TO STRENGTH TRAINING
413. Øyvind Støren: RUNNING AND CYCLING ECONOMY IN ATHLETES; DETERMINING FACTORS, TRAINING INTERVENTIONS AND TESTING
414. Håkon Hov: HEPATOCYTE GROWTH FACTOR AND ITS RECEPTOR C-MET. AUTOCRINE GROWTH AND SIGNALING IN MULTIPLE MYELOMA CELLS
415. Maria Radtke: ROLE OF AUTOIMMUNITY AND OVERSTIMULATION FOR BETA-CELL DEFICIENCY. EPIDEMIOLOGICAL AND THERAPEUTIC PERSPECTIVES
416. Liv Bente Romundstad: ASSISTED FERTILIZATION IN NORWAY: SAFETY OF THE REPRODUCTIVE TECHNOLOGY
417. Erik Magnus Berntsen: PREOPERATIV PLANNING AND FUNCTIONAL NEURONAVIGATION – WITH FUNCTIONAL MRI AND DIFFUSION TENSOR TRACTOGRAPHY IN PATIENTS WITH BRAIN LESIONS
418. Tonje Strømmen Steigedal: MOLECULAR MECHANISMS OF THE PROLIFERATIVE RESPONSE TO THE HORMONE GASTRIN
419. Vidar Rao: EXTRACORPOREAL PHOTOCHEMOTHERAPY IN PATIENTS WITH CUTANEOUS T CELL LYMPHOMA OR GRAFT-vs-HOST DISEASE
420. Torkild Visnes: DNA EXCISION REPAIR OF URACIL AND 5-FLUOROURACIL IN HUMAN CANCER CELL LINES

2010

421. John Munkhaugen: BLOOD PRESSURE, BODY WEIGHT, AND KIDNEY FUNCTION IN THE NEAR-NORMAL RANGE: NORMALITY, RISK FACTOR OR MORBIDITY ?
422. Ingrid Castberg: PHARMACOKINETICS, DRUG INTERACTIONS AND ADHERENCE TO TREATMENT WITH ANTIPSYCHOTICS: STUDIES IN A NATURALISTIC SETTING
423. Jian Xu: BLOOD-OXYGEN-LEVEL-DEPENDENT-FUNCTIONAL MAGNETIC RESONANCE IMAGING AND DIFFUSION TENSOR IMAGING IN TRAUMATIC BRAIN INJURY RESEARCH
424. Sigmund Simonsen: ACCEPTABLE RISK AND THE REQUIREMENT OF PROPORTIONALITY IN EUROPEAN BIOMEDICAL RESEARCH LAW. WHAT DOES THE REQUIREMENT THAT BIOMEDICAL RESEARCH SHALL NOT INVOLVE RISKS AND BURDENS DISPROPORTIONATE TO ITS POTENTIAL BENEFITS MEAN?
425. Astrid Woodhouse: MOTOR CONTROL IN WHIPLASH AND CHRONIC NON-TRAUMATIC NECK PAIN
426. Line Rørstad Jensen: EVALUATION OF TREATMENT EFFECTS IN CANCER BY MR IMAGING AND SPECTROSCOPY
427. Trine Moholdt: AEROBIC EXERCISE IN CORONARY HEART DISEASE
428. Øystein Olsen: ANALYSIS OF MANGANESE ENHANCED MRI OF THE NORMAL AND INJURED RAT CENTRAL NERVOUS SYSTEM
429. Bjørn H. Grønberg: PEMETREXED IN THE TREATMENT OF ADVANCED LUNG CANCER
430. Vigdis Schnell Husby: REHABILITATION OF PATIENTS UNDERGOING TOTAL HIP ARTHROPLASTY WITH FOCUS ON MUSCLE STRENGTH, WALKING AND AEROBIC ENDURANCE PERFORMANCE
431. Torbjørn Øien: CHALLENGES IN PRIMARY PREVENTION OF ALLERGY. THE PREVENTION OF ALLERGY AMONG CHILDREN IN TRONDHEIM (PACT) STUDY.
432. Kari Anne Indredavik Evensen: BORN TOO SOON OR TOO SMALL: MOTOR PROBLEMS IN ADOLESCENCE
433. Lars Adde: PREDICTION OF CEREBRAL PALSY IN YOUNG INFANTS. COMPUTER BASED ASSESSMENT OF GENERAL MOVEMENTS
434. Magnus Fasting: PRE- AND POSTNATAL RISK FACTORS FOR CHILDHOOD ADIPOSITY
435. Vivi Talstad Monsen: MECHANISMS OF ALKYLATION DAMAGE REPAIR BY HUMAN AlkB HOMOLOGUES
436. Toril Skandsen: MODERATE AND SEVERE TRAUMATIC BRAIN INJURY. MAGNETIC RESONANCE IMAGING FINDINGS, COGNITION AND RISK FACTORS FOR DISABILITY

437. Ingeborg Smidesang: ALLERGY RELATED DISORDERS AMONG 2-YEAR OLDS AND ADOLESCENTS IN MID-NORWAY – PREVALENCE, SEVERITY AND IMPACT. THE PACT STUDY 2005, THE YOUNG HUNT STUDY 1995-97
438. Vidar Halsteinli: MEASURING EFFICIENCY IN MENTAL HEALTH SERVICE DELIVERY: A STUDY OF OUTPATIENT UNITS IN NORWAY
439. Karen Lehrmann Ægidius: THE PREVALENCE OF HEADACHE AND MIGRAINE IN RELATION TO SEX HORMONE STATUS IN WOMEN. THE HUNT 2 STUDY
440. Madelene Ericsson: EXERCISE TRAINING IN GENETIC MODELS OF HEART FAILURE
441. Marianne Klokk: THE ASSOCIATION BETWEEN SELF-REPORTED ECZEMA AND COMMON MENTAL DISORDERS IN THE GENERAL POPULATION. THE HORDALAND HEALTH STUDY (HUSK)
442. Tomas Ottemo Stølen: IMPAIRED CALCIUM HANDLING IN ANIMAL AND HUMAN CARDIOMYOCYTES REDUCE CONTRACTILITY AND INCREASE ARRHYTHMIA POTENTIAL – EFFECTS OF AEROBIC EXERCISE TRAINING
443. Bjarne Hansen: ENHANCING TREATMENT OUTCOME IN COGNITIVE BEHAVIOURAL THERAPY FOR OBSESSIVE COMPULSIVE DISORDER: THE IMPORTANCE OF COGNITIVE FACTORS
444. Mona Løvlien: WHEN EVERY MINUTE COUNTS. FROM SYMPTOMS TO ADMISSION FOR ACUTE MYOCARDIAL INFARCTION WITH SPECIAL EMPHASIS ON GENDER DIFFERECES
445. Karin Margaretha Gilljam: DNA REPAIR PROTEIN COMPLEXES, FUNCTIONALITY AND SIGNIFICANCE FOR REPAIR EFFICIENCY AND CELL SURVIVAL
446. Anne Byriel Walls: NEURONAL GLIAL INTERACTIONS IN CEREBRAL ENERGY – AND AMINO ACID HOMEOSTASIS – IMPLICATIONS OF GLUTAMATE AND GABA
447. Cathrine Fallang Knetter: MECHANISMS OF TOLL-LIKE RECEPTOR 9 ACTIVATION
448. Marit Følsvik Svindseth: A STUDY OF HUMILIATION, NARCISSISM AND TREATMENT OUTCOME IN PATIENTS ADMITTED TO PSYCHIATRIC EMERGENCY UNITS
449. Karin Elvenes Bakkelund: GASTRIC NEUROENDOCRINE CELLS – ROLE IN GASTRIC NEOPLASIA IN MAN AND RODENTS
450. Kirsten Brun Kjelstrup: DORSOVENTRAL DIFFERENCES IN THE SPATIAL REPRESENTATION AREAS OF THE RAT BRAIN
451. Roar Johansen: MR EVALUATION OF BREAST CANCER PATIENTS WITH POOR PROGNOSIS
452. Rigmor Myran: POST TRAUMATIC NECK PAIN. EPIDEMIOLOGICAL, NEURORADIOLOGICAL AND CLINICAL ASPECTS
453. Krisztina Kunszt Johansen: GENEALOGICAL, CLINICAL AND BIOCHEMICAL STUDIES IN *LRRK2* – ASSOCIATED PARKINSON'S DISEASE
454. Pål Gjerden: THE USE OF ANTICHOLINERGIC ANTIPARKINSON AGENTS IN NORWAY. EPIDEMIOLOGY, TOXICOLOGY AND CLINICAL IMPLICATIONS
455. Else Marie Huuse: ASSESSMENT OF TUMOR MICROENVIRONMENT AND TREATMENT EFFECTS IN HUMAN BREAST CANCER XENOGRAFTS USING MR IMAGING AND SPECTROSCOPY
456. Khalid S. Ibrahim: INTRAOPERATIVE ULTRASOUND ASSESSMENT IN CORONARY ARTERY BYPASS SURGERY – WITH SPECIAL REFERENCE TO CORONARY ANASTOMOSES AND THE ASCENDING AORTA
457. Bjørn Øglænd: ANTHROPOMETRY, BLOOD PRESSURE AND REPRODUCTIVE DEVELOPMENT IN ADOLESCENCE OF OFFSPRING OF MOTHERS WHO HAD PREECLAMPSIA IN PREGNANCY
458. John Olav Roaldset: RISK ASSESSMENT OF VIOLENT, SUICIDAL AND SELF-INJURIOUS BEHAVIOUR IN ACUTE PSYCHIATRY – A BIO-PSYCHO-SOCIAL APPROACH
459. Håvard Dalen: ECHOCARDIOGRAPHIC INDICES OF CARDIAC FUNCTION – NORMAL VALUES AND ASSOCIATIONS WITH CARDIAC RISK FACTORS IN A POPULATION FREE FROM CARDIOVASCULAR DISEASE, HYPERTENSION AND DIABETES: THE HUNT 3 STUDY
460. Beate André: CHANGE CAN BE CHALLENGING. INTRODUCTION TO CHANGES AND IMPLEMENTATION OF COMPUTERIZED TECHNOLOGY IN HEALTH CARE
461. Latha Nrugham: ASSOCIATES AND PREDICTORS OF ATTEMPTED SUICIDE AMONG DEPRESSED ADOLESCENTS – A 6-YEAR PROSPECTIVE STUDY

462. Håvard Bersås Nordgaard: TRANSIT-TIME FLOWMETRY AND WALL SHEAR STRESS ANALYSIS OF CORONARY ARTERY BYPASS GRAFTS – A CLINICAL AND EXPERIMENTAL STUDY

Cotutelle with University of Ghent: Abigail Emily Swillens: A MULTIPHYSICS MODEL FOR IMPROVING THE ULTRASONIC ASSESSMENT OF LARGE ARTERIES

2011

463. Marte Helene Bjørk: DO BRAIN RHYTHMS CHANGE BEFORE THE MIGRAINE ATTACK? A LONGITUDINAL CONTROLLED EEG STUDY
464. Carl-Jørgen Arum: A STUDY OF UROTHELIAL CARCINOMA: GENE EXPRESSION PROFILING, TUMORIGENESIS AND THERAPIES IN ORTHOTOPIC ANIMAL MODELS
465. Ingunn Harstad: TUBERCULOSIS INFECTION AND DISEASE AMONG ASYLUM SEEKERS IN NORWAY. SCREENING AND FOLLOW-UP IN PUBLIC HEALTH CARE
466. Leif Åge Strand: EPIDEMIOLOGICAL STUDIES AMONG ROYAL NORWEGIAN NAVY SERVICEMEN. COHORT ESTABLISHMENT, CANCER INCIDENCE AND CAUSE-SPECIFIC MORTALITY
467. Katrine Høyer Holgersen: SURVIVORS IN THEIR THIRD DECADE AFTER THE NORTH SEA OIL RIG DISASTER OF 1980. LONG-TERM PERSPECTIVES ON MENTAL HEALTH
468. MarianneWallenius: PREGNANCY RELATED ASPECTS OF CHRONIC INFLAMMATORY ARTHRITIDES: DISEASE ONSET POSTPARTUM, PREGNANCY OUTCOMES AND FERTILITY. DATA FROM A NORWEGIAN PATIENT REGISTRY LINKED TO THE MEDICAL BIRTH REGISTRY OF NORWAY
469. Ole Vegard Solberg: 3D ULTRASOUND AND NAVIGATION – APPLICATIONS IN LAPAROSCOPIC SURGERY
470. Inga Ekeberg Schjerve: EXERCISE-INDUCED IMPROVEMENT OF MAXIMAL OXYGEN UPTAKE AND ENDOTHELIAL FUNCTION IN OBESE AND OVERWEIGHT INDIVIDUALS ARE DEPENDENT ON EXERCISE-INTENSITY
471. Eva Veslemøy Tyldum: CARDIOVASCULAR FUNCTION IN PREECLAMPSIA – WITH REFERENCE TO ENDOTHELIAL FUNCTION, LEFT VENTRICULAR FUNCTION AND PRE-PREGNANCY PHYSICAL ACTIVITY
472. Benjamin Garzón Jiménez de Cisneros: CLINICAL APPLICATIONS OF MULTIMODAL MAGNETIC RESONANCE IMAGING
473. Halvard Knut Nilsen: ASSESSING CODEINE TREATMENT TO PATIENTS WITH CHRONIC NON-MALIGNANT PAIN: NEUROPSYCHOLOGICAL FUNCTIONING, DRIVING ABILITY AND WEANING
474. Eiliv Brenner: GLUTAMATE RELATED METABOLISM IN ANIMAL MODELS OF SCHIZOPHRENIA
475. Egil Jonsbu: CHEST PAIN AND PALPITATIONS IN A CARDIAC SETTING; PSYCHOLOGICAL FACTORS, OUTCOME AND TREATMENT
476. Mona Høysæter Fenstad: GENETIC SUSCEPTIBILITY TO PREECLAMPSIA : STUDIES ON THE NORD-TRØNDELAG HEALTH STUDY (HUNT) COHORT, AN AUSTRALIAN/NEW ZEALAND FAMILY COHORT AND DECIDUA BASALIS TISSUE
477. Svein Erik Gaustad: CARDIOVASCULAR CHANGES IN DIVING: FROM HUMAN RESPONSE TO CELL FUNCTION
478. Karin Torvik: PAIN AND QUALITY OF LIFE IN PATIENTS LIVING IN NURSING HOMES
479. Arne Solberg: OUTCOME ASSESSMENTS IN NON-METASTATIC PROSTATE CANCER
480. Henrik Sahlin Pettersen: CYTOTOXICITY AND REPAIR OF URACIL AND 5-FLUOROURACIL IN DNA
481. Pui-Lam Wong: PHYSICAL AND PHYSIOLOGICAL CAPACITY OF SOCCER PLAYERS: EFFECTS OF STRENGTH AND CONDITIONING
482. Ole Solheim: ULTRASOUND GUIDED SURGERY IN PATIENTS WITH INTRACRANIAL TUMOURS
483. Sten Roar Snare: QUANTITATIVE CARDIAC ANALYSIS ALGORITHMS FOR POCKET-SIZED ULTRASOUND DEVICES
484. Marit Skyrud Bratlie: LARGE-SCALE ANALYSIS OF ORTHOLOGS AND PARALOGS IN VIRUSES AND PROKARYOTES
485. Anne Elisabeth F. Isern: BREAST RECONSTRUCTION AFTER MASTECTOMY – RISK OF RECURRENCE AFTER DELAYED LARGE FLAP RECONSTRUCTION – AESTHETIC OUTCOME, PATIENT SATISFACTION, QUALITY OF LIFE AND SURGICAL RESULTS;

HISTOPATHOLOGICAL FINDINGS AND FOLLOW-UP AFTER PROPHYLACTIC MASTECTOMY IN HEREDITARY BREAST CANCER

486. Guro L. Andersen: CEREBRAL PALSY IN NORWAY – SUBTYPES, SEVERITY AND RISK FACTORS
487. Frode Kolstad: CERVICAL DISC DISEASE – BIOMECHANICAL ASPECTS
488. Bente Nordtug: CARING BURDEN OF COHABITANTS LIVING WITH PARTNERS SUFFERING FROM CHRONIC OBSTRUCTIVE PULMONARY DISEASE OR DEMENTIA
489. Mariann Gjervik Heldahl: EVALUATION OF NEOADJUVANT CHEMOTHERAPY IN LOCALLY ADVANCED BREAST CANCER BASED ON MR METHODOLOGY
490. Lise Tevik Løvseth: THE SUBJECTIVE BURDEN OF CONFIDENTIALITY
491. Marie Hjelmseth Aune: INFLAMMATORY RESPONSES AGAINST GRAM NEGATIVE BACTERIA INDUCED BY TLR4 AND NLRP12
492. Tina Strømdal Wik: EXPERIMENTAL EVALUATION OF NEW CONCEPTS IN HIP ARTHROPLASTY
493. Solveig Sigurdardottir: CLINICAL ASPECTS OF CEREBRAL PALSY IN ICELAND. A POPULATION-BASED STUDY OF PRESCHOOL CHILDREN
494. Arne Reimers: CLINICAL PHARMACOKINETICS OF LAMOTRIGINE
495. Monica Wegling: KULTURMENNESKETS BYRDE OG SYKDOMMENS VELSIGNELSE. KAN MEDISINSK UTREDNING OG INTERVENSJON HA EN SELVSTENDIG FUNKSJON UAVHENGIG AV DET KURATIVE?
496. Silje Alvestad: ASTROCYTE-NEURON INTERACTIONS IN EXPERIMENTAL MESIAL TEMPORAL LOBE EPILEPSY – A STUDY OF UNDERLYING MECHANISMS AND POSSIBLE BIOMARKERS OF EPILEPTOGENESIS
497. Javaid Nauman: RESTING HEART RATE: A MATTER OF LIFE OR DEATH – PROSPECTIVE STUDIES OF RESTING HEART RATE AND CARDIOVASCULAR RISK (THE HUNT STUDY, NORWAY)
498. Thuy Nguyen: THE ROLE OF C-SRC TYROSINE KINASE IN ANTIVIRAL IMMUNE RESPONSES
499. Trine Naalsund Andreassen: PHARMACOKINETIC, PHARMACODYNAMIC AND PHARMACOGENETIC ASPECTS OF OXYCODONE TREATMENT IN CANCER PAIN
500. Eivor Alette Laugsand: SYMPTOMS IN PATIENTS RECEIVING OPIOIDS FOR CANCER PAIN – CLINICAL AND PHARMACOGENETIC ASPECTS
501. Dorthe Stensvold: PHYSICAL ACTIVITY, CARDIOVASCULAR HEALTH AND LONGEVITY IN PATIENTS WITH METABOLIC SYNDROME
502. Stian Thoresen Aspenes: PEAK OXYGEN UPTAKE AMONG HEALTHY ADULTS – CROSS-SECTIONAL DESCRIPTIONS AND PROSPECTIVE ANALYSES OF PEAK OXYGEN UPTAKE, PHYSICAL ACTIVITY AND CARDIOVASCULAR RISK FACTORS IN HEALTHY ADULTS (20-90 YEARS)
503. Reidar Alexander Vigen: PATHOBIOLOGY OF GASTRIC CARCINOIDS AND ADENOCARCINOMAS IN RODENT MODELS AND PATIENTS. STUDIES OF GASTROCYSTOPLASTY, GENDER-RELATED FACTORS, AND AUTOPHAGY
504. Halvard Høilund-Kaupang: MODELS AND METHODS FOR INVESTIGATION OF REVERBERATIONS IN NONLINEAR ULTRASOUND IMAGING
505. Audhild Løhre: WELLBEING AMONG SCHOOL CHILDREN IN GRADES 1-10: PROMOTING AND ADVERSE FACTORS
506. Torgrim Tandstad: VOX POPULI. POPULATION-BASED OUTCOME STUDIES IN TESTICULAR CANCER
507. Anna Brenne Grønskag: THE EPIDEMIOLOGY OF HIP FRACTURES AMONG ELDERLY WOMEN IN NORD-TRØNDELAG. HUNT 1995-97, THE NORD-TRØNDELAG HEALTH STUDY
508. Kari Ravndal Risnes: BIRTH SIZE AND ADULT MORTALITY: A SYSTEMATIC REVIEW AND A LONG-TERM FOLLOW-UP OF NEARLY 40 000 INDIVIDUALS BORN AT ST. OLAV UNIVERSITY HOSPITAL IN TRONDHEIM 1920-1960
509. Hans Jakob Bøe: LONG-TERM POSTTRAUMATIC STRESS AFTER DISASTER – A CONTROLLED STUDY OF SURVIVORS' HEALTH 27 YEARS AFTER THE CAPSIZED NORTH SEA OIL RIG
510. Cathrin Barbara Canto, Cotutelle with University of Amsterdam: LAYER SPECIFIC INTEGRATIVE PROPERTIES OF ENTORHINAL PRINCIPAL NEURONS
511. Ioanna Sandvig: THE ROLE OF OLFACTORY ENSHEATHING CELLS, MRI, AND BIOMATERIALS IN TRANSPLANT-MEDIATED CNS REPAIR

512. Karin Fahl Wader: HEPATOCYTE GROWTH FACTOR, C-MET AND SYNDECAN-1 IN MULTIPLE MYELOMA
513. Gerd Tranø: FAMILIAL COLORECTAL CANCER
514. Bjarte Bergstrøm: INNATE ANTIVIRAL IMMUNITY – MECHANISMS OF THE RIG-I-MEDIATED RESPONSE
515. Marie Søfteland Sandvei: INCIDENCE, MORTALITY, AND RISK FACTORS FOR ANEURYSMAL SUBARACHNOID HEMORRHAGE. PROSPECTIVE ANALYZES OF THE HUNT AND TROMSØ STUDIES
516. Mary-Elizabeth Bradley Eilertsen: CHILDREN AND ADOLESCENTS SURVIVING CANCER: PSYCHOSOCIAL HEALTH, QUALITY OF LIFE AND SOCIAL SUPPORT
517. Takaya Saito: COMPUTATIONAL ANALYSIS OF REGULATORY MECHANISM AND INTERACTIONS OF MICRORNAS

Godkjent for disputas, publisert post mortem: Eivind Jullumstrø: COLORECTAL CANCER AT LEVANGER HOSPITAL 1980-2004

518. Christian Gutvik: A PHYSIOLOGICAL APPROACH TO A NEW DECOMPRESSION ALGORITHM USING NONLINEAR MODEL PREDICTIVE CONTROL
519. Ola Storrø: MODIFICATION OF ADJUVANT RISK FACTOR BEHAVIOURS FOR ALLERGIC DISEASE AND ASSOCIATION BETWEEN EARLY GUT MICROBIOTA AND ATOPIC SENSITIZATION AND ECZEMA. EARLY LIFE EVENTS DEFINING THE FUTURE HEALTH OF OUR CHILDREN
520. Guro Fanneløb Giskeødegård: IDENTIFICATION AND CHARACTERIZATION OF PROGNOSTIC FACTORS IN BREAST CANCER USING MR METABOLOMICS
521. Gro Christine Christensen Løhaugen: BORN PRETERM WITH VERY LOW BIRTH WEIGHT – NEVER ENDING COGNITIVE CONSEQUENCES?
522. Sigrid Nakrem: MEASURING QUALITY OF CARE IN NURSING HOMES – WHAT MATTERS?
523. Brita Pukstad: CHARACTERIZATION OF INNATE INFLAMMATORY RESPONSES IN ACUTE AND CHRONIC WOUNDS

2012

524. Hans H. Wasmuth: ILEAL POUCHES
525. Inger Økland: BIASES IN SECOND-TRIMESTER ULTRASOUND DATING RELATED TO PREDICTION MODELS AND FETAL MEASUREMENTS
526. Bjørn Mørkedal: BLOOD PRESSURE, OBESITY, SERUM IRON AND LIPIDS AS RISK FACTORS OF ISCHAEMIC HEART DISEASE
527. Siver Andreas Moestue: MOLECULAR AND FUNCTIONAL CHARACTERIZATION OF BREAST CANCER THROUGH A COMBINATION OF MR IMAGING, TRANSCRIPTOMICS AND METABOLOMICS
528. Guro Aune: CLINICAL, PATHOLOGICAL, AND MOLECULAR CLASSIFICATION OF OVARIAN CARCINOMA
529. Ingrid Alsos Lian: MECHANISMS INVOLVED IN THE PATHOGENESIS OF PRE-ECLAMPSIA AND FETAL GROWTH RESTRICTION. TRANSCRIPTIONAL ANALYSES OF PLACENTAL AND DECIDUAL TISSUE
530. Karin Solvang-Garten: X-RAY REPAIR CROSS-COMPLEMENTING PROTEIN 1 – THE ROLE AS A SCAFFOLD PROTEIN IN BASE EXCISION REPAIR AND SINGLE STRAND BREAK REPAIR
531. Toril Holien: BONE MORPHOGENETIC PROTEINS AND MYC IN MULTIPLE MYELOMA
532. Rooyen Mavenyengwa: *STREPTOCOCCUS AGALACTIAE* IN PREGNANT WOMEN IN ZIMBABWE: EPIDEMIOLOGY AND SEROTYPE MARKER CHARACTERISTICS
533. Tormod Rimehaug: EMOTIONAL DISTRESS AND PARENTING AMONG COMMUNITY AND CLINIC PARENTS