

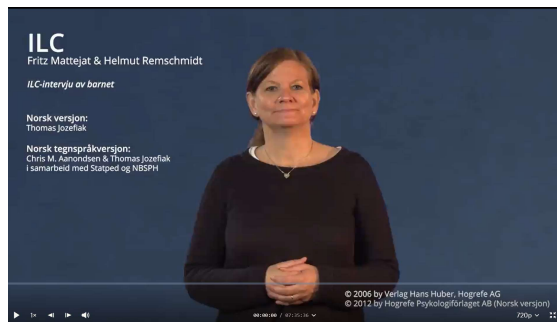
# Assessing and Understanding Mental Health and Quality of Life in Deaf and Hard-of-Hearing Children and Adolescents



Joining Forces, New Perspectives  
February 8th, 2024

Chris M. Aanonsen  
Clinical Psychologist, PhD

# Conclusion



Prevalence of mental health problems for DHH children in Norway 2x

DHH children report similar QoL to TH children (in contrast to their parents)

Associations between communicative competence and mental health/QoL

# Overview

Background

Aims

Methods

Results

Paper I

Paper II

Paper III

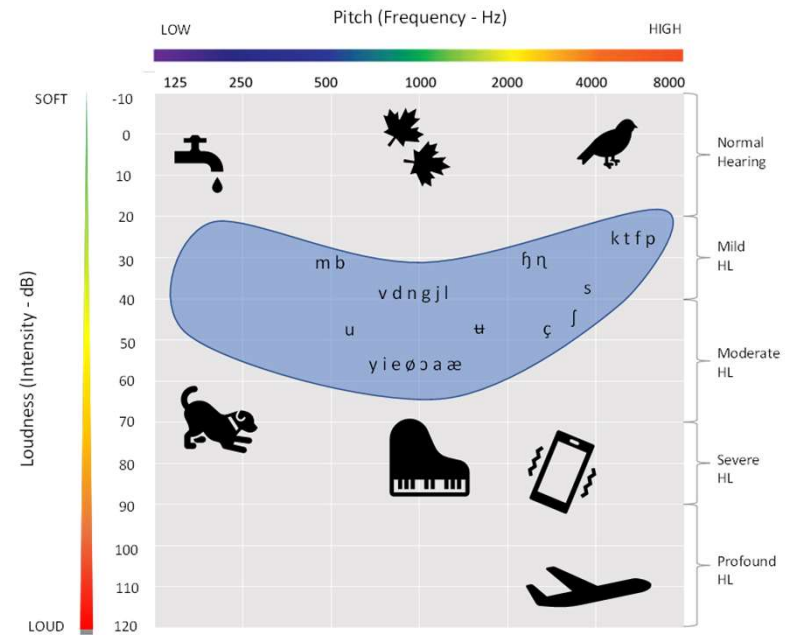
Conclusion

Implications



Photo: Unsplash

# Deaf, deaf or hard-of-hearing





# Mental Health in DHH children



## Prevalence

(Dammeyer, 2010; Fellingner et al., 2012; Theunissen, Rieffe, Netten, et al., 2014; ; Stevenson et al., 2015; Overgaard et al., 2021)

# Risk and protective factors

## Aetiology of HL

(Hindley et al., 1994; Brown et al., 2000; van Gent et al., 2012; Theunissen et al., 2014)

## Additional disabilities

(Dammeyer, 2010; Hintermair, 2007; Stevenson et al., 2011; Theunissen et al., 2014).

## Cognitive ability

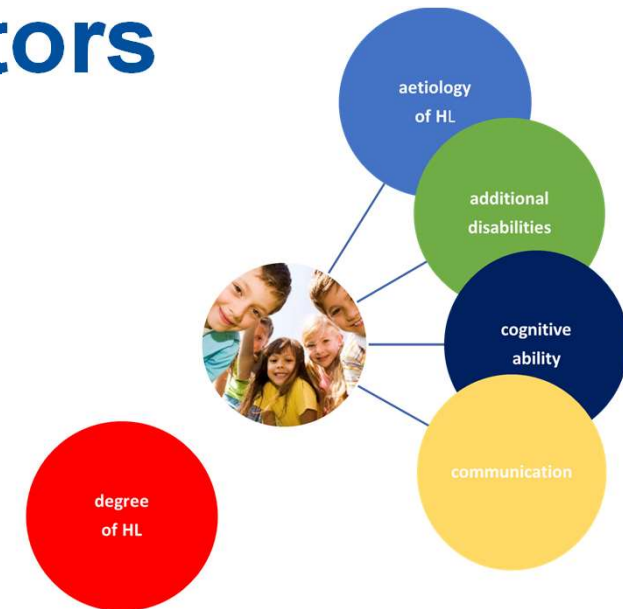
(Theunissen et al., 2014; van Eldik, 2005; van Eldik et al., 2004; van Gent et al., 2007)

## Communication

(Dammeyer, 2010; Hindley, 1997; Hintermair, 2013; Theunissen et al., 2014; Fellingner et al., 2009; van Eldik et al., 2004; Vostanis et al., 1997)

## Degree of HL

(Hintermair, 2007; Fellingner et al., 2009; Dammeyer, 2010; Theunissen et al., 2014)



# Challenges in assessing DHH children

## Overlap of cultural and linguistic factors

(Chovaz, 2017; Heiling & Eidevall, 2011; Cornes et al., 2006)

## Measures standardised for TH children

(Wilkins et al., 2021)

## DHH children under-report symptoms on written measures/interviews

(Cornes & Brown, 2012; Cornes et al., 2006, Hindley et al., 1993)



Image: Pixabay

# Consequences of the challenges

## Misinterpretation, misdiagnosis => impact treatment choices

(Wilkins et al., 2021; Øhre et al., 2014; du Feu & Chovaz, 2014; Black & Glickman, 2006)

## Standardised and validated measures in sign languages

(Roberts et al., 2015; Øhre et al., 2014)

## Specialised mental health services/trained clinicians

(Wilkins et al., 2021; Sessa & Sutherland, 2013; Fellingner et al., 2012; Wright et al., 2012)

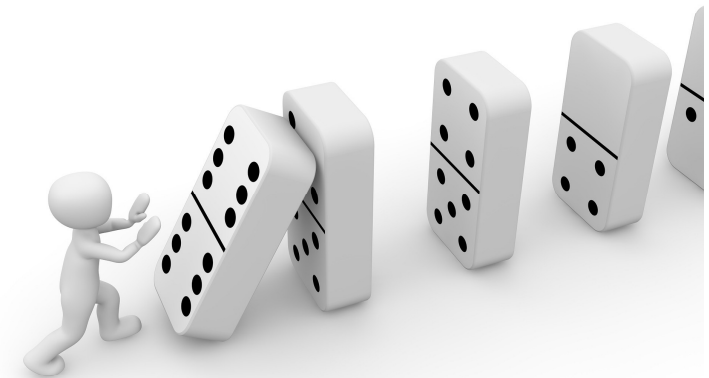


Image: Pixabay

St meld nr 25  
(1996-97)

Apenhet og helhet  
Om psykiske lidelser og tjenestetilbudene

7-2001  
Utdragingsliste

Statens helsetilsyn

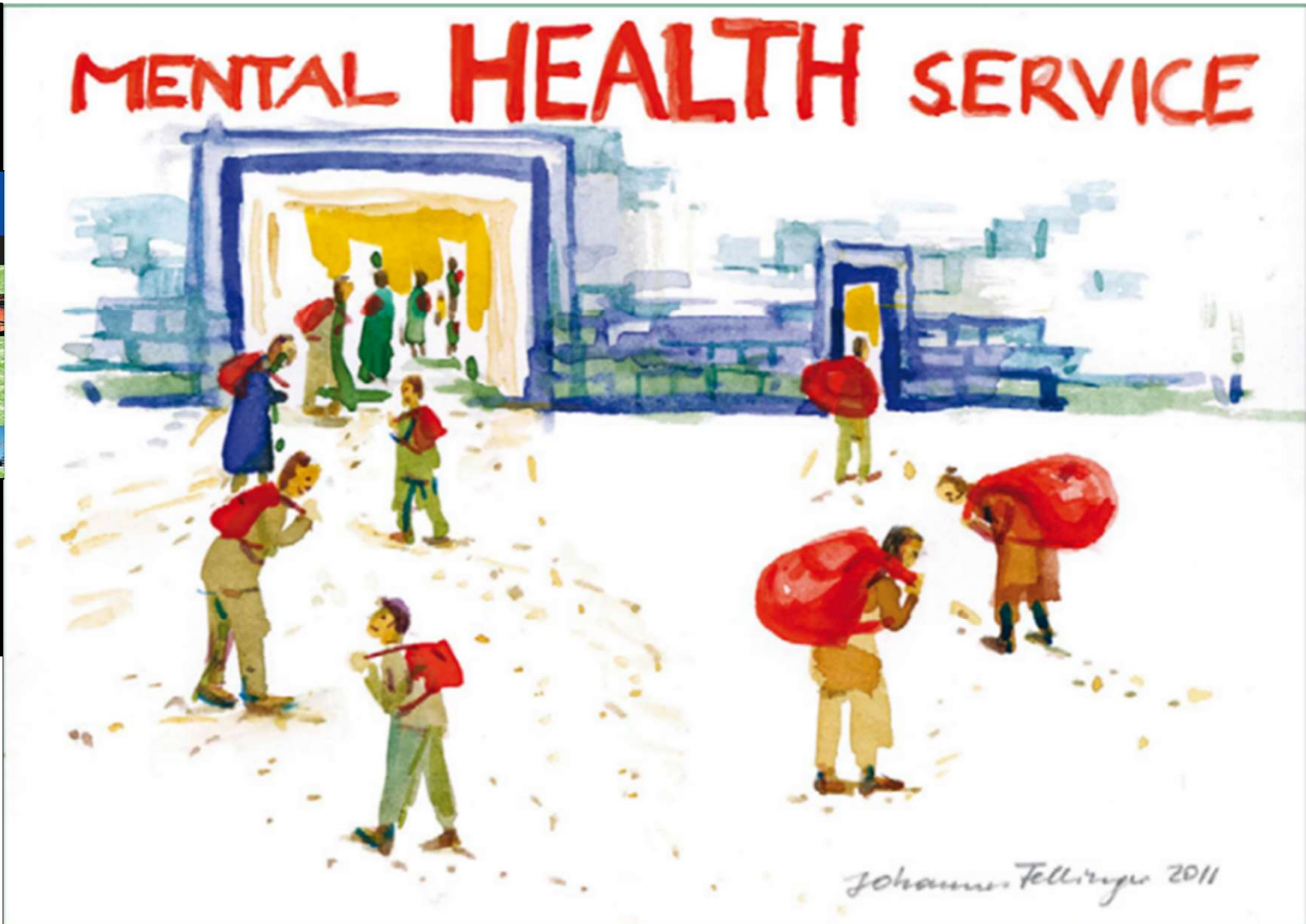
Tjenestetilbudene til de med psykiske lidelser

6<sup>th</sup> WORLD CONGRESS ON  
MENTAL HEALTH & PSYCHIAL DISORDERS  
300<sup>th</sup> ANNUAL MEETING OF THE  
INTERNATIONAL ASSOCIATION OF  
PSYCHIATRY  
16-19 SEPTEMBER 2014

DECLARATION ON MENTAL HEALTH & CARE

Convention on  
the Rights of Persons  
with Disabilities and  
Optional Protocol

UNITED NATIONS





# Quality of Life in DHH children

QoL: child's **subjective** well-being in several life domains

(Jozefiak et al., 2012)

Lack of studies and consensus

(Roland et al., 2016; Hintermair, 2011; Lin and Niparko, 2006)

Factors associated with QoL

Degree of HL

(Qi et al., 2020; Hintermair, 2010; Reeh et al., 2008)

Age

(Aanondsen et al., 2018; Pardo-Guijarro et al., 2015; Kushalnagar et al., 2011)

Communication?

(Haukedal et al., 2020; Haukedal et al., 2018; Kushalnagar et al., 2011)



Photo: iStock

# Communication

## Myths associated with bilingualism

(Genesee, 2015; Petitto et al., 2001)

## Mode of communication for DHH children debated since the 18th century

(Grønlie, 2005; Stokoe, 1960)

## Lack of studies, especially on social and functional language, and on pragmatic skills

(Fitzpatrick et al., 2016; Kirkehei et al., 2011; Crowe & Dammeyer, 2021; Holzinger et al., 2020; Kermit, 2010)

## Access to signing peers and adults

(Hauland et al., 2021; Lyxell, 2019)



# Aims

Translate validated measures for mental health and QoL into NSL

Validate the NSL versions of these measures

Gain a better understanding of Norwegian DHH children and adolescents' mental health, QoL and communication



# Research questions

## Paper I

What are the psychometric properties of the SDQ-NSL and SDQ-NOR for DHH children?

What are the correlations between the two language and informant versions?

What do the D children think about the usability of the two language versions?

## Paper II

What are the psychometric properties of the ILC-NSL and ILC-NOR for (D)HH children?

What are the correlations between the two language and informant versions?

What do the D children think about the usability of the two language versions?

# Research questions

## Paper III

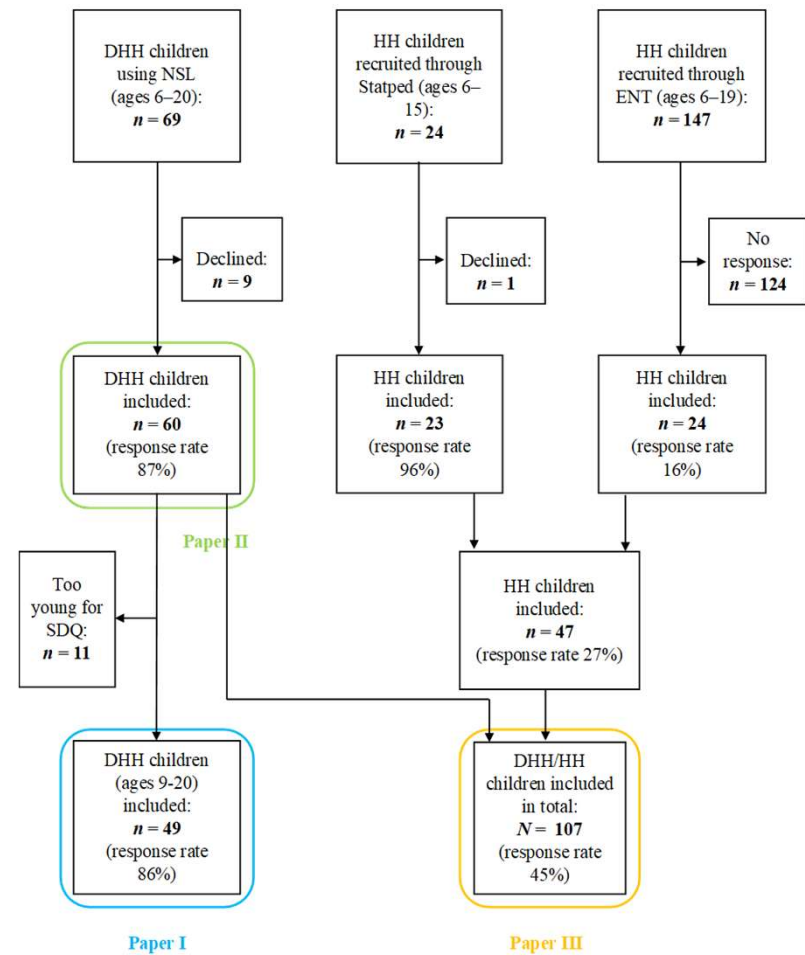
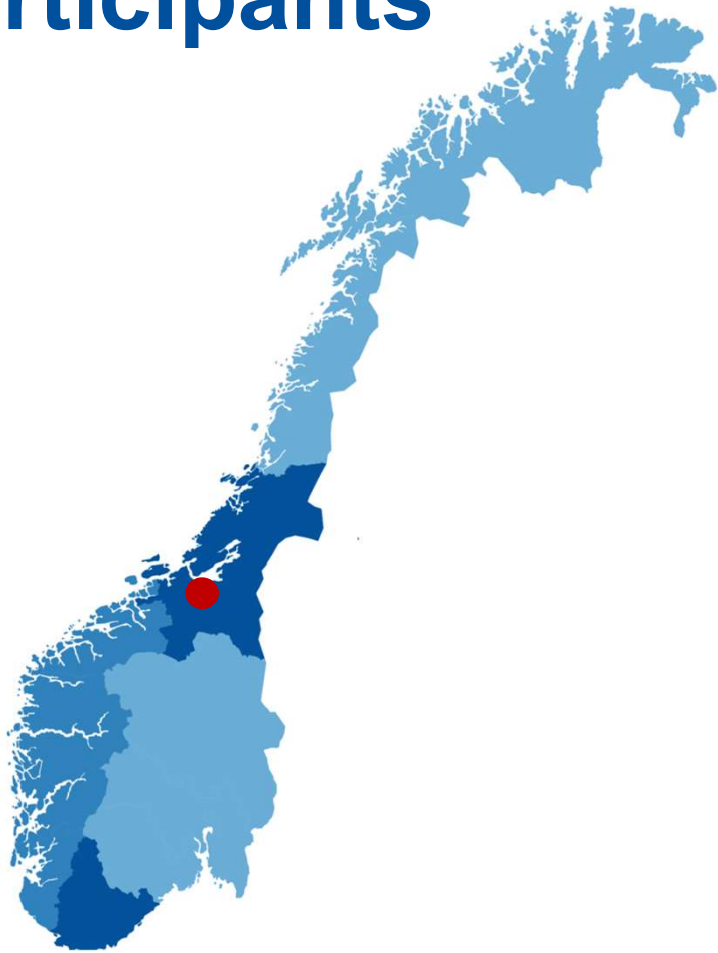
Are there differences in mental health/QoL between D, HH and TH children (self- and parent-report)?

Is there an association between DHH children's degree of hearing loss and mental health/QoL?

Is there an association between DHH children's communication (spoken and sign language; communicative competence) and mental health/QoL?



# Participants



# Measures

**Sterke og svake sider (SDQ-Nor)**  
 Vennligst kryss av for hvert utsagn; Stemmer ikke, Stemmer delvis eller Stemmer helt. Prøv å svare på så selv om du ikke er helt sikker eller synes utsagnet virker rart. Svar på grunnlag av hvordan du har hatt det de siste 6 månedene.

Ditt navn \_\_\_\_\_ Gutt/Jente \_\_\_\_\_  
 Fødselsdato \_\_\_\_\_

	Stemmer ikke	Stemmer delvis	Stemmer helt
Jeg prøver å være hyggelig mot andre. Jeg byr meg om hva de får	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jeg er rasisk. Jeg kan ikke være lenge i ro	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jeg har ofte hodpine, vondt i magen eller kvalme	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Jeg leter gjerne med
- Jeg blir ofte sint og
- Jeg er ofte for meg og
- Jeg gjør som regel de
- Jeg hater meg selv
- Jeg stiller opp hvis
- Jeg er stadig urolig og
- Jeg har en eller flere i
- Jeg slår mye. Jeg har
- Jeg er ofte lei meg, se
- Jeg blir som regel litt
- Jeg blir lett distrauert,
- Jeg blir nervøs i nye
- Jeg er snill mot de som
- Jeg blir ofte borte/får
- Andre barn eller omg
- Jeg slår meg ofte til
- Jeg tenker mye om de
- Jeg tar ting som ikke
- Jeg kommer bedre om
- Jeg er redd for myr, b
- Jeg fullfører oppgaver

## ILC

### ILC-Spørreskjema for ungdom

Navnet ditt: \_\_\_\_\_ Dato: \_\_\_\_\_  
 Alder: \_\_\_\_\_ Kjønn:  Jente  Gutt

Vi ber om at du svarer på noen spørsmål om hvordan du vurderer din situasjon. Tenk hovedsakelig på den siste uken og sett ett kryss i hver linje.

- Hvor godt takler du \_\_\_\_\_
- Hvor godt er forhold (foreldre, spiken)? \_\_\_\_\_
- Howdan kommer du (fridren)? \_\_\_\_\_
- I hvilken grad kan du, interesser, aktivitet \_\_\_\_\_
- Howdan vurderer du \_\_\_\_\_
- Howdan vurderer du \_\_\_\_\_
- Hvis du sammenfatt livet ditt: Howdan gi \_\_\_\_\_

Copyright © 2006 Verlog Hans Huber, Hogrefe AG  
 Trykk: Katarina Nykja, Oslo/Trondheim 2

## The Children's Communication Checklist Second Edition

### Norsk versjon, bokmål

#### Instruksjon

CCC-2 ble utviklet for å hjelpe oss til bedre å forstå sterke og svake sider ved barns kommunikasjon. Selv om språktesting av et barn kan gi kunnskap om hvordan barnet kommuniserer, er det også nyttig å få vite hvordan barnet faktisk bruker språket i dagliglivet. Du kan hjelpe oss med dette ved å fylle ut de neste sidene.

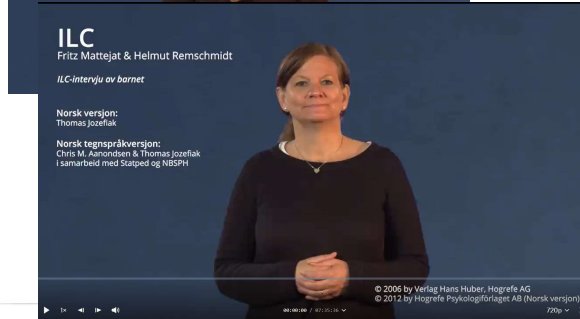
Sjekklisten inneholder en rekke utsagn som sier noe om hvordan barn kommuniserer. For hvert utsagn blir du bedt om å gi opplysninger om det aktuelle barnet. Du blir bedt om å avgjøre om du har observert den aktuelle atferden:

- 0 = Sjeldnere enn en gang i uken (eller aldri)
- 1 = Minst en gang i uken, men ikke hver dag
- 2 = En eller to ganger om dagen
- 3 = Flere (mer enn to) ganger om dagen (eller alltid)

Sett en ring rundt det tallet du synes beskriver barnets kommunikasjon best, i ruten bak hvert utsagn. Hvis du synes det er vanskelig å avgjøre dette, så forenk å huske hvor ofte i løpet av den siste uken du har observert den atferden som beskrives i utsagnet. Les nøy gjennom hvert utsagn og vennligst ikke hopp over noen. Dessuten det er et utsagn du absolutt ikke kan ta stilling til, kan du sette en X til høyre for det. Du kan også skrive kommentarer ved siden av hvis du ønsker.

Informasjon om barnet:

År \_\_\_\_\_ Måned \_\_\_\_\_ Dag \_\_\_\_\_  
 Utfyllingsdato: \_\_\_\_\_



#### CAP - Vurdering av auditiv funksjon

Sett et kryss ved nivået, som passer best på barnet:

0	Ingen oppmerksomhet overfor lyder i omgivelsene eller stemmer.
1	Reagerer på minst fem forskjellige lyder i omgivelsene.
2	
3	
4	
5	
6	
7	

#### VTF - Vurdering av tegnspråklig forståelse

Sett et kryss ved nivået, som passer best på barnet:

0	Registrerer ikke eller oppfatter ikke tegn.
1	Registrerer tegn.
2	Forstår enkelte tegn, mest konkrete tegn. (F.eks. forstår tegnet for bil, ball eller spise)
3	Forstår tegn uten at kontekst hjelper til (F.eks. at barnet ikke kan se tingene som det snakkes om.) Forstår abstrakte tegn. (F.eks. tegnene "tisse", "passe" etc.)

#### SIR - Vurdering av taleforståelighet

Sett et kryss ved nivået, som passer best på barnet:

1	Sammenhengende tale er uforståelig. Barnet bruker lyder.
2	Sammenhengende tale er uforståelig. Man kan begynne å forstå enkelte ord, når man vet hva det snakkes om, og når man kan minne seg på barnet.
3	
4	
5	

#### VTP - Vurdering av tegnspråklig produksjon

Sett et kryss ved nivået, som passer best på barnet:

1	Barnet produserer ikke egne tegn. Bruker enkelte gester og pekinger.
2	Barnet kan produserer enkelte vanlige tegn når konteksten hjelper til.
3	Barnet kan tegne enkelte handlingsforlyer av minimum to-tre tegn. Tegnspråket er forståelig for personer som kjenner barnet godt.
4	Barnet kan tegne setninger med flere enn tre tegn som ikke nødvendigvis er grammatisk korrekte. Enkel bruk av proformer. Tegnspråket er forståelig for personer som kan tegnspråk, men som ikke kjenner barnet.

# Statistics

Independent and paired samples t-tests (paper I-III)

Dillon Goldstein's rho (paper I and II) /Cronbach's  $\alpha$  (paper II)

Intraclass correlations (paper I and II)

Spearman's rank correlation coefficient (paper I and II)

Partial Least Squares Structural Equation Modelling (paper I and II)

Confirmatory Factor Analysis (paper I and II)

Linear regression analysis (paper III)



Photo: Pixabay

# Results



Journal of Deaf Studies and Deaf Education, 2019, 1–14  
doi: 10.1093/deaf/dkz026  
Empirical Manuscript

## EMPIRICAL MANUSCRIPT

### Validation of the Strengths and Difficulties Self-Report in Norwegian Sign Language

Chris Margaret Anonnsen<sup>1,2,\*</sup>, Thomas Jozefak<sup>1</sup>, Kerstin Heiling<sup>3</sup> and Tormod Rimehaug<sup>1,4,†</sup>

<sup>1</sup>Norwegian University of Science and Technology (NTNU), <sup>2</sup>St. Olavs Hospital Trondheim University Hospital, <sup>3</sup>Lund University and <sup>4</sup>Nord-Trendelag Hospital Trust

\*Correspondence should be sent to: Chris Margaret Anonnsen, KR01 MØI-Høys, NTNU Postboks 8055 MTT, 7491 Trondheim, Norway (e-mail: c.m.a.anonnsen@ntnu.no)

#### Abstract

The majority of studies on mental health in deaf and hard-of-hearing (DHH) children report a higher level of mental health problems. Inconsistencies in reports of prevalence of mental health problems have been found to be related to a number of factors such as language skills, cognitive ability, heterogeneous samples as well as validity problems caused by using written measures designed for typically hearing children. This study evaluates the psychometric properties of the self-report version of the Strengths and Difficulties Questionnaire (SDQ) in Norwegian Sign Language (NSL, SDQ-NSL) and in written Norwegian (SDQ-NOR). Forty-nine DHH children completed the SDQ-NSL, as well as the SDQ-NOR in a randomized order and their parents completed the parent version of the SDQ-NOR and a questionnaire on hearing and language-related information. Internal consistency was examined using Dillon-Goldstein's rho, test-retest reliability using intraclass correlations, construct validity by confirmatory factor analysis (CFA), and partial least squares structural equation modeling. Internal consistency and test-retest reliability were established as acceptable to good. CFA resulted in a best fit for the proposed five-factor model for both versions, although not all fit indices reached acceptable levels. The reliability and validity of the SDQ-NSL seem promising even though the validation was based on a small sample size.

Two reviews and a meta-analysis have reported an elevated prevalence of emotional and behavioral problems in deaf and hard-of-hearing (DHH) children and adolescents across countries, informants, and measures (Föllinger, Holzinger, & Pollard, 2012; Stevenson, Kreppner, Pinpoint, Worsfold, & Kennedy, 2015; Thomsen et al., 2014). For brevity the term “children” will be used to describe both children and adolescents in this paper. The majority of studies have reported that 20–50% of DHH children suffer from mental health problems (Christiansen, 2019); Föllinger, Holzinger, Sattel, & Lauch, 2008; Hiltner, 2007; van Eldik, 2005; van Eldik, Theffers, Vierman, & Wehli, 2006; van Gent, Goedhart, Hiltner, & Theffers, 2007) whereas Strakosken (1994) reported rates comparable to those of typically hearing (TH) children based on teacher reports. Mejstad, Heiling, and

Svein (2009) found equivalent rates of emotional and behavioral problems in DHH and TH boys based on the self-report version of the Strengths and Difficulties Questionnaire (SDQ). Föllinger, Holzinger, Sattel, Lauch, and Goldberg (2009) found point and lifetime prevalence rates of 32.6% and 45.3%, respectively, for any psychiatric disorder in a representative Austrian DHH sample of children. Thomsen et al. (2014) concluded in their systematic review that DHH were more likely to suffer from depression, aggression, oppositional defiant disorder, and conduct disorder than their TH peers. A possible cause for differences in prevalence rates found for DHH children are heterogeneous samples as well as different inclusion criteria across studies such as different degrees of hearing loss (HL) and modes of communication. Additional disabilities, commu-

Tormod Rimehaug, <http://orcid.org/0008-0903-4915-9410>  
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<https://doi.org/10.1186/s12888-023-04787-9>

BMC Psychiatry

## RESEARCH ARTICLE

## Open Access

### Psychometric properties of the Inventory of Life Quality in children and adolescents in Norwegian Sign Language

Chris Margaret Anonnsen<sup>1,2,\*</sup>, Thomas Jozefak<sup>1</sup>, Kerstin Heiling<sup>3</sup>, Stian Lydersen<sup>4</sup> and Tormod Rimehaug<sup>1,4,†</sup>

#### Abstract

**Background:** Several studies have assessed the Quality of Life (QoL) in Deaf and hard-of-hearing (DHH) children and adolescents. The findings from these studies, however, vary from DHH children reporting lower QoL than their typically hearing (TH) peers to similar QoL and even higher QoL. These differences have been attributed to contextual and individual factors such as degree of access to communication; the participants' age as well as measurement error. Using written instead of sign language measures has been shown to underestimate mental health symptoms in DHH children and adolescents. It is expected that translating generic QoL measures into sign language will help gain more accurate reports from DHH children and adolescents, thus eliminating one of the sources for the observed differences in research conclusions. Hence, the aim of the current study is to translate the Inventory of Life Quality in Children and Adolescents into Norwegian Sign Language (ILC-NSL) and to evaluate the psychometric properties of the self-report of the ILC-NSL and the written Norwegian version (ILC-NOR) for DHH children and adolescents. The parent report was included for comparison. Associations between child self-report and parent-report are also provided.

**Methods:** Fifty-six DHH children completed the ILC-NSL and ILC-NOR in randomized order while their parents completed the parent-report of the ILC-NOR and a questionnaire on hearing- and language-related information. Internal consistency was examined using Dillon-Goldstein's rho and Cronbach's alpha. ILC-NSL and ILC-NOR were compared using intraclass correlation coefficients. Construct validity was examined by partial least squares structural equation modeling (PLS-SEM).

**Results:** Regarding reliability, the internal consistency was established as acceptable to good, whereas the comparison of the ILC-NSL with the ILC-NOR demonstrated closer correspondence for the adolescent version of the ILC than for the child version. The construct validity, as evaluated by PLS-SEM, resulted in an acceptable fit for the proposed one-factor model for both language versions for adolescents as well as the complete sample.

**Conclusion:** The reliability and validity of the ILC-NSL seem promising, especially for the adolescent version, even though the validation was based on a small sample of DHH children and adolescents.

**Keywords:** Quality of life, DHH children, Psychometric properties, Sign language

#### Background

##### Quality of life in Deaf and hard-of-hearing children and adolescents

The number of studies on Quality of Life (QoL) in Deaf and hard-of-hearing (DHH) children and adolescents has increased over the past decades, mainly focusing on



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<https://doi.org/10.1186/s12888-023-04787-9>

BMC Psychiatry

## RESEARCH ARTICLE

## Open Access

### Deaf and hard-of-hearing children and adolescents' mental health, Quality of Life and communication

Chris Margaret Anonnsen<sup>1,2,\*</sup>, Thomas Jozefak<sup>1</sup>, Stian Lydersen<sup>4</sup>, Kerstin Heiling<sup>3</sup> and Tormod Rimehaug<sup>1,4,†</sup>

#### Abstract

Mental health problems and lower Quality of Life (QoL) are more common in deaf and hard-of-hearing – (D)HH – children than in typically hearing (TH) children. Communication has been repeatedly linked to both mental health and QoL. The aims of this study were to compare mental health and QoL between signing deaf and hard-of-hearing (D&H), hard-of-hearing (H&H) and TH children and to study associations between mental health/QoL and severity of hearing loss and communication. 106 children and adolescents (mean age 11.8, SD = 3.42), 59 of them DHH and 47 HH, and their parents reported child mental health and QoL outcomes. Parents also provided information about their children's communication, hearing loss and education while their children's cognitive ability was assessed. Although (D)HH and their parents rated their mental health similar to their TH peers, about twice as many (D)HH children rated themselves in the clinical range. However, (D)HH children rated their QoL as similar to their TH peers, while their parents rated it significantly lower. Associations between communicative competence, parent-reported mental health and QoL were found, whereas severity of hearing loss based on parent-report had no significant association with either mental health or QoL. These results are in line with other studies and emphasize the need to follow up on (D)HH children's mental health, QoL, and communication.

**Keywords** Mental health, Quality of Life, Deaf and hard-of-hearing children, Communication, Sign language

#### Background

For decades, mental health problems in deaf and hard-of-hearing “(D)HH” children and adolescents have been of clinical and research interest. In this paper, mental health problems are defined as the presence of symptoms of mental health disorders (e.g. low mood, problems with attention, etc.) as well as mental health disorders based on diagnostic classification, i.e. the combination and severity of symptoms combined with clinically significant loss of function. In the following sections, the term “HH” refers to hard-of-hearing children with a preference for spoken language, “DHH” to signing deaf and hard-of-hearing children and “D&HH” to both groups, while the term “children” will describe both children and adolescents in this paper.

\*Correspondence: Chris Margaret Anonnsen, [chrism.a.anonnsen@ntnu.no](mailto:chrism.a.anonnsen@ntnu.no)  
<sup>1</sup>Regional Centre for Child and Youth Mental Health and Child Welfare (RBU), Central Norway, Department of Mental Health, Faculty of Medicine and Health Sciences, NTNU – Norwegian University of Science and Technology, RBU i Møi-Høys, NTNU Postboks 8055 MTT, 7491 Trondheim, Norway  
<sup>2</sup>Unit for Deaf and Hard-of-Hearing Children and Adolescents in Central Norway, Department of Child and Adolescent Psychiatry, St. Olavs Hospital, Trondheim, Norway  
<sup>3</sup>Hanna, Sweden  
<sup>4</sup>Department of Child and Adolescent Psychiatry, Nord-Trendelag Hospital Trust, Levanger, Norway



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# Paper I

Internal consistency  
Test-retest reliability

} acceptable to good

Construct validity acceptable on some indices

Correlations between NSL and NOR sign.

Correlations between informants similar to other studies

Usability of language versions, 55% prefer SDQ-NOR



Journal of Deaf Studies and Deaf Education, 2019, 1-14

doi: 10.1093/dsde/dn026  
Empirical Manuscript

## EMPIRICAL MANUSCRIPT

### Validation of the Strengths and Difficulties Self-Report in Norwegian Sign Language

Chris Margaret Aanonsen<sup>1,2,\*</sup>, Thomas Jozefiak<sup>1</sup>, Kerstin Heiling<sup>3</sup> and Tormod Rimehaug<sup>1,4,†</sup>

<sup>1</sup>Norwegian University of Science and Technology (NTNU), <sup>2</sup>St. Olavs Hospital Trondheim University Hospital, <sup>3</sup>Lund University and <sup>4</sup>Nord-Trendelag Hospital Trust

\*Correspondence should be sent to Chris Margaret Aanonsen, KRKJ MSJ-Norge, NTNU Postboks 8055 MTF, 7491 Trondheim, Norway (e-mail: chris.m.aanonsen@ntnu.no)

#### Abstract

The majority of studies on mental health in deaf and hard-of-hearing (DHH) children report a higher level of mental health problems. Inconsistencies in reports of prevalence of mental health problems have been found to be related to a number of factors such as language skills, cognitive ability, heterogeneous samples as well as validity problems caused by using written measures designed for typically hearing children. This study evaluates the psychometric properties of the self-report version of the Strengths and Difficulties Questionnaire (SDQ) in Norwegian Sign Language (NSL; SDQ-NSL) and in written Norwegian (SDQ-NOR). Forty nine DHH children completed the SDQ-NSL as well as the SDQ-NOR in randomized order and their parents completed the parent version of the SDQ-NOR and a questionnaire on hearing and language-related information. Internal consistency was examined using Dillon-Goldstein's rho, test-retest reliability using intraclass correlations, construct validity by confirmatory factor analysis (CFA), and partial least squares structural equation modeling. Internal consistency and test-retest reliability were established as acceptable to good; CFA resulted in a best fit for the proposed five-factor model for both versions, although not all fit indices reached acceptable levels. The reliability and validity of the SDQ-NSL seem promising even though the validation was based on a small sample size.

Two reviews and a meta-analysis have reported an elevated prevalence of emotional and behavioral problems in deaf and hard of hearing (DHH) children and adolescents across countries, informants, and measures (Föllinger, Heiling, & Felland, 2012; Stevenson, Kuppert, Pimperton, Worsfold, & Kennedy, 2015; Thurnissen et al., 2014). For brevity, the term "children" will be used to describe both children and adolescents in this paper. The majority of studies have reported that 20-50% of DHH children suffer from mental health problems (Dammyev, 2010; Föllinger, Heiling, Sater, & Lauth, 2008; Hinnerwat, 2002; van Eldik, 2005; van Eldik, Treffers, Veerman, & Verhulst, 2004; van Gent, Goedhart, Hindley, & Treffers, 2001) whereas Stikkeloren (1994) reported rates comparable to those of typically hearing (TH) children based on teacher reports. Mojtab, Heiling, and

Swelin (2009) found equivalent rates of emotional and behavioral problems in DHH and TH boys based on the self-report version of the Strengths and Difficulties Questionnaire (SDQ). Föllinger, Heiling, Sater, Lauth, and Goldberg (2009) found point and lifetime prevalence rates of 32.6% and 45.3%, respectively, for any psychiatric disorder in a representative Austrian DHH sample of children. Thurnissen et al. (2014) concluded in their systematic review that DHH were more likely to suffer from depression, aggression, oppositional defiant disorder, and conduct disorder than their TH peers. A possible cause for differences in prevalence rates found for DHH children are heterogeneous samples as well as different inclusion criteria across studies such as different degrees of hearing loss (HL) and modes of communication. Additional disabilities, communica-

†Tormod Rimehaug, <http://orcid.org/0000-0003-4915-9410>  
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# Paper II

Internal consistency acceptable to good

Construct validity acceptable goodness of fit

Correlations between NSL and NOR sign. (adolescent version)

Correlations between informants similar to other studies

Usability of language versions, 56% prefer ILC-NOR

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BMC Psychology

RESEARCH ARTICLE

Open Access

## Psychometric properties of the Inventory of Life Quality in children and adolescents in Norwegian Sign Language

Chris Margaret Aanonsen<sup>1\*</sup>, Thomas Jozefak<sup>2</sup>, Kerstin Helling<sup>1</sup>, Stian Lydersen<sup>2</sup> and Tormod Rimehaug<sup>2,4</sup>

### Abstract

**Background:** Several studies have assessed the Quality of Life (QoL) in Deaf and hard-of-hearing (DHH) children and adolescents. The findings from these studies, however, vary from DHH children reporting lower QoL than their typically hearing (TH) peers to similar QoL and even higher QoL. These differences have been attributed to contextual and individual factors such as degree of access to communication, the participants' age as well as measurement error. Using written instead of sign language measures has been shown to underestimate mental health symptoms in DHH children and adolescents. It is expected that translating generic QoL measures into sign language will help gain more accurate reports from DHH children and adolescents, thus eliminating one of the sources for the observed differences in research conclusions. Hence, the aim of the current study is to translate the Inventory of Life Quality in Children and Adolescents into Norwegian Sign Language (ILC-NSL) and to evaluate the psychometric properties of the self-report of the ILC-NSL and the written Norwegian version (ILC-NOR) for DHH children and adolescents. The parent report was included for comparison. Associations between child self-report and parent-report are also provided.

**Methods:** Fifty-six DHH children completed the ILC-NSL and ILC-NOR in randomized order while their parents completed the parent-report of the ILC-NOR and a questionnaire on hearing- and language-related information. Internal consistency was examined using Dillon-Goldstein's rho and Cronbach's alpha. ILC-NSL and ILC-NOR were compared using intraclass correlation coefficients. Construct validity was examined by partial least squares structural equation modeling (PLS-SEM).

**Results:** Regarding reliability, the internal consistency was established as acceptable to good, whereas the comparison of the ILC-NSL with the ILC-NOR demonstrated closer correspondence for the adolescent version of the ILC than for the child version. The construct validity, as evaluated by PLS-SEM, resulted in an acceptable fit for the proposed one-factor model for both language versions for adolescents as well as the complete sample.

**Conclusion:** The reliability and validity of the ILC-NSL seem promising, especially for the adolescent version, even though the validation was based on a small sample of DHH children and adolescents.

**Keywords:** Quality of life, DHH children, Psychometric properties, Sign language

### Background Quality of life in Deaf and hard-of-hearing children and adolescents

The number of studies on Quality of Life (QoL) in Deaf and hard-of-hearing (DHH) children and adolescents has increased over the past decades, mainly focusing on

\*Correspondence: [chris.aanonsen@ntnu.no](mailto:chris.aanonsen@ntnu.no)  
<sup>1</sup>Department of Mental Health, Faculty of Medicine and Health Sciences, NTNU – Norwegian University of Science and Technology, Trondheim, Norway  
 Full list of author information is available at the end of the article



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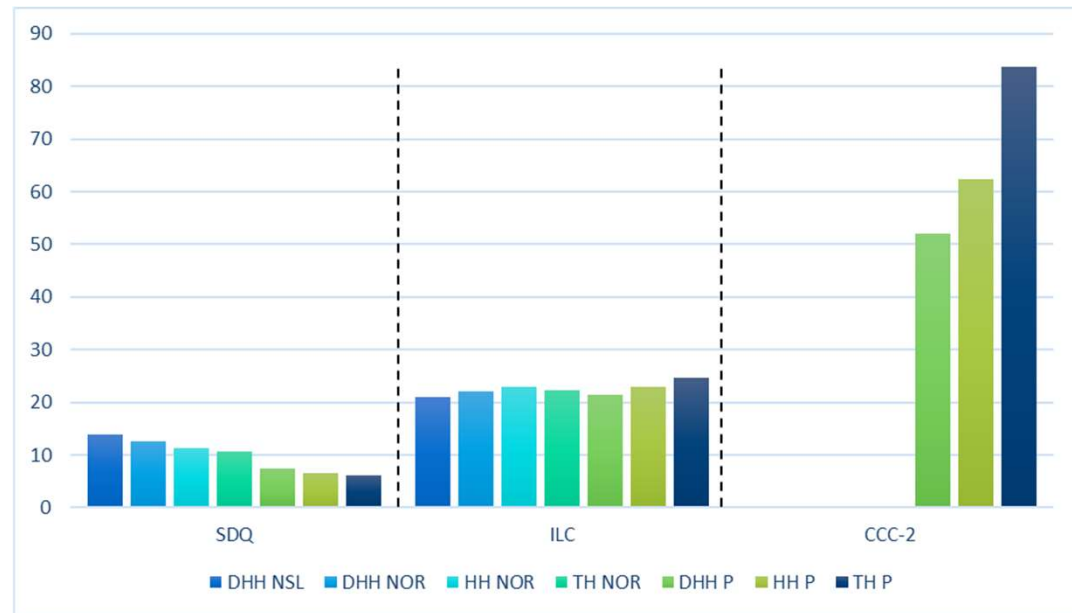
# Paper III

No sign. differences in mental health/ QoL between D and HH Children

DHH children are twice as likely to report mental health problems

DHH children report QoL similar to TH children

Sign. associations between communicative competence and parent-reported mental health/QoL



# Conclusion

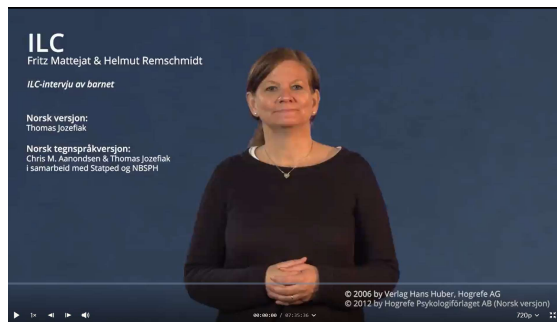


Image: Pixabay

Prevalence of mental health problems for DHH children 2x

DHH children report similar QoL to TH children (in contrast to their parents)

Importance of communicative competence for mental health and QoL

# Implications

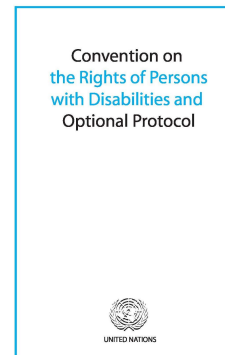
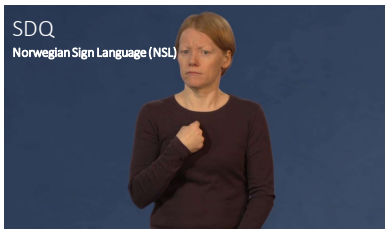
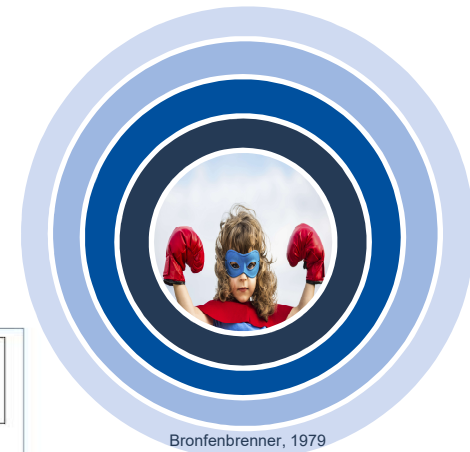
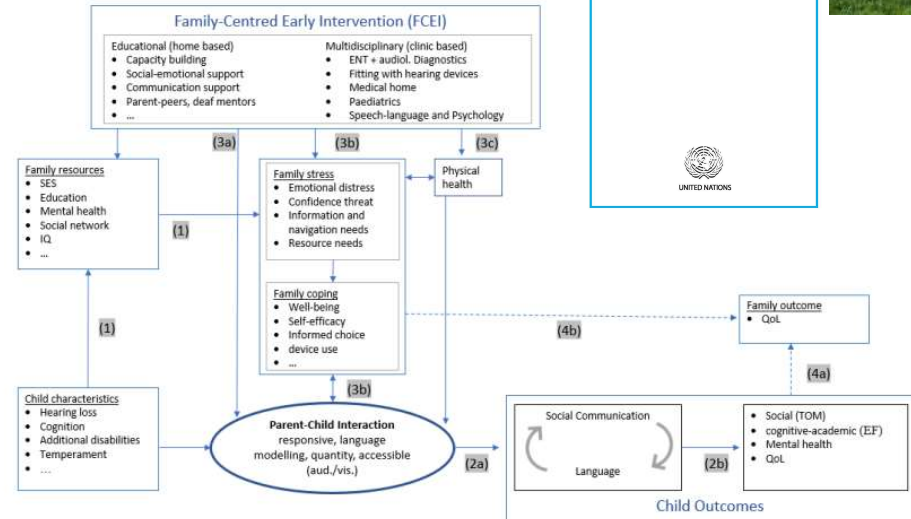


Image: Pixabay



*“If I say yes to another person’s language, I have said yes to that person.*

*If I say no to another person’s language, I have said no to that person,*

*Because language is a part of who we are.”*

Thank you!

Photo: Thinkstock

