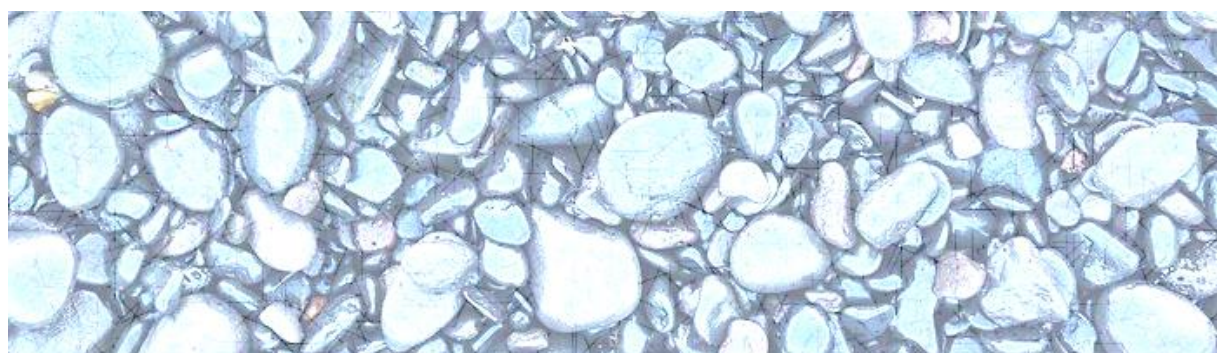# (Meta)Theoretical gateways in studies on assessment and documentation in preschool – a research review with a Scandinavian focus

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Abstract: The purpose of this article is to describe and collate search results and analysis of research with a focus on (meta)theoretical gateways in assessment and documentation in Scandinavian preschools between 2006 and 2014, supplemented by delimited international research mainly from 2013-2014. The intention is also to highlight what the research indicates about assessment competence in relation to the (meta)theoretical gateways. The final search results include 153 national and international studies from sources including the Nordic Base of Early Childhood Education and Care (NB-ECEC, 2006-2012). The results indicate that research into assessment in preschool is still a relatively young and undeveloped field, while the field of documentation, and pedagogical documentation in particular, has a significantly higher standing. As more and more different forms of assessment and documentation assume their place in preschools, it becomes increasingly important to gain knowledge and awareness of the potential benefits, limitations and consequences of various forms and practices for assessment and documentation. Theoretical gateways vary, as do the forms of assessment and documentation used. The analysis indicates that assessment competence can include professional assessment based on a variety of scientific grounds. Regarding the expanded documentation and evaluation task and the preschool's complex assessment and documentation practices, there is a need for both expanded research and expanded competence, which can focus on a *multi-voiced assessment competence*.

Keywords: Assessment, documentation, preschool, Scandinavia

Different countries use a range of methods and practices to monitor staff performance and children's learning and development in early childhood education and care (ECEC), including observations, checklists, surveys, self-assessments and inspections. These methods and practices are administered by actors including national, regional and local authorities; external inspectors; ECEC staff and/or management; and parents (e.g. Bennett, 2010; OECD, 2012, 2013). Hence, there are great differences in the design and implementation of monitoring approaches across and even within countries. According to the "Starting Strong" report by the Organisation for Economic Co-operation and Development (OECD), "Nordic countries tend to avoid using the term 'child outcomes', while Anglo-Saxon countries favour the approach" (OECD, 2012, p. 1). Anglo-Saxon approaches are characterised more as outcome-oriented, with learning outcomes at the individual level and goals to be achieved. Nordic approaches are characterised by being more input-oriented and activity-focused, with goals to work towards and content constructed as objects in thematic orientations. However, both of these traditions seem to co-exist to a certain extent in current Nordic early childhood education guidelines, along with a growing interest in documenting and assessing the development of individual children. A comparative analysis of national guidelines for Nordic preschools, conducted in 2013, found that documentation and assessment at the individual level are currently regulated in all of the Nordic countries. This includes, for example, language screening of three-year-olds in Denmark, individualised plans in Finland, assessment of each child's development in Iceland, language mapping in Norway and systematic documentation of each child's learning and development in Sweden (Vallberg Roth, 2014). Some researchers stress that preschool staff should have both an opportunity and an obligation "to assess children's development and learning at the individual level" (von Greiff, Sjögren & Wieselgren, 2012:2, p. 114). Consequently there is a need for a research review on the topic of assessment and documentation in preschool with a Scandinavian focus.

Scandinavian ECEC curricula are embedded in decentralised governance systems, with responsibility shared between the national, municipal and local preschool levels. Given that the Scandinavian countries have similar goal-setting systems, the Scandinavian research in the Nordic Base of Early Childhood Education and Care (NB-ECEC) database is of the utmost relevance for this research review[1]. At the time of the search, the database covered the years 2006-2012. However, although the focus in this article is on the inventory in the Scandinavian database, this is supplemented by national, Nordic and international research, mainly from 2013-2014 (see note 1). The present article is thus based on the time period between 2006 and 2014.

Review articles are an attempt to sum up the current state of the research on a particular topic; which in this case covers assessment and documentation in preschools. The writer searches for studies relevant to the topic, and then synthesises the results into a coherent view. This article

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[1] The present article is based on a mapping of research on assessment and documentation in preschool, with a special focus on research on the Swedish preschool. This mapping was conducted for the Swedish Research Council and the Swedish School Research Institute, and the original report has been published in Swedish as a SKOLFORSK report, *Preschool: Early Intervention* (Tallberg Broman, 2015). The report included four study parts, the second of which dealt with assessment and documentation in preschools (Vallberg Roth, 2015). This article is an abridged and modified version of the second study part of the report. The reason why the NB-ECEC database was chosen as the primary data source in this article is connected to the SKOLFORSK project, in which all four part-studies used the NB-ECEC as a base to allow connections and interlinkings between these part-studies. In the second study part, and in this article, the search in the NB-ECEC was supplemented by national, Nordic and international research. Within the timeframes, scope and structure of the SKOLFORSK project, the focus on international studies only covered a limited period between 2013 and 2014. The international studies may only be seen as *examples* of documentation and assessment studies outside Scandinavia. The search work in the other databases, including Swepub, Libris, ERIC via Ebsco and ERC, was also systematic and carried out in close collaboration with a search specialist and librarian at Malmö University (see method section).

addresses two primary questions. What characterises the research in this field, and what (meta)theoretical gateways are featured in research on assessment and documentation in preschool? What does the research indicate about assessment competence in preschool? The article will cover variations, major advances, significant gaps and ideas for future research.

Purpose and questions

The purpose of this article is to describe and collate search results and analysis of research with a focus on (meta)theoretical gateways in assessment and documentation in Scandinavian preschools between 2006 and 2014, supplemented by delimited international research mainly from 2013-2014 (see note 1). The intention is also to highlight what the research indicates about assessment competence in relation to the (meta)theoretical gateways. The research review is guided by the following questions:

> *What (meta)theoretical gateways are featured in research on assessment and documentation in preschool between 2006 and 2014? What does the research indicate about assessment competence in preschool?*

Delimitation and focus

This article limits its focus to studies addressing assessment and documentation as aspects of the exercise of one's profession in preschool. This means that various forms of "metrics" and psychometric studies are not in focus (cf. Swedish Research Council, 2014, where metrics studies are included), as these are preferentially designed and analysed by professional groups other than teachers: researchers, test designers, statisticians, subject matter experts and so on. Such "metrics" derive more from a measurement theory perspective, while assessment, as the term is used in this study, has to do rather with teachers using their professional judgement to interpret and evaluate the educational activities (including staff performance and staff input) or the children's learning, skills and processes in relation to the educational activities and the relevant context. In corresponding fashion, studies concerning documentation are focused on and limited to "educational documentation" rather than documentation of a more administrative or financial nature.

Assessment and documentation could be considered as two different concepts. However, this research overview connects assessment with documentation, and includes only studies with empirical data on assessments and values interwoven in documentation. The overview does not include any studies based on empirical data with assessments only outside of documentation, and none of the studies include anything that might be considered value-free or assessment-free documentation. In general, one might also say that the concept of assessment could refer to what can be considered distinct practices; that is, the monitoring of staff performance and the assessment of children's learning. The first is then seen as an assessment that could be performed and initiated by external agencies, managers or researchers, while the second assessment could be an internal activity performed by the preschool teachers themselves. In the mapped studies included in this overview, assessments linked to children's learning as well as to staff performance and staff input may be both external and internal. Hence, the studies may also include examples of assessment in documentation (estimating tools) that may be both performed by external actors and performed by preschool teachers as internal assessment (self-assessment on educational activities including staff input). Even if the mapped studies may have different directions, focus and functions, they all have some connection to documentation and assessment practice in preschool.

Bennett (2010) argues that the Nordic tradition favours multiple assessment procedures; this is consistent with the studies collected in the present article. In the field of educational science, the

term "assessment" can refer to the evaluation of the performance of each child at the individual level. However, the term "evaluation" generally refers to the evaluation of the educational activities, systems, programmes and preschool as an organisation. The term "follow-up" can be interpreted as ongoing monitoring, while "evaluation" pertains more to a precise evaluation and subsequent assessment at a specific time at the activity level; an assessment in relation to goals, indicators and/or criteria in national steering documents. Evaluation does not entail a complete monitoring and evaluation of everything in the preschool, but rather is limited to selected portions thereof (e.g. Vallberg Roth, 2014).

There is in the preschool a relatively long-standing tradition of internal and local evaluation, in which staff can take the initiative in making decisions within given limits, particularly in decentralised goal-setting systems. Practices have evolved from relatively simple to more complex evaluations, in which more and more stakeholders and actors have become involved at various levels, and where both internal and external assessments and inspections have been intensified in a trend toward recentralisation (ibid).

In other words, assessment and evaluation may be viewed as polysemantic terms that constitute a form of action in shifting contexts and practices, both on and between different levels. In this study, the term "assessment" preferentially pertains to profession- and practice-based work in preschool education, which may be characterised as both linear (predetermined and goal-oriented) and non-linear (not predetermined). Furthermore, the term, as already mentioned, may include both external and internal assessment and documentation that can be produced and used by actors at various levels, and which can be interpreted as bearing on profession- and practice-based preschool work in the decentralised and recentralised goal-setting systems. The concept of competence (which is considered together with assessment in one of the questions addressed in this article) refers to an individual's ability to perform a task by applying knowledge and skills; that is, a suitable capacity for action in a specific context.

Recentralisation involves the re-assumption of responsibility and authority by the State. One example of this is the Swedish Schools Inspectorate; this became a separate agency in 2008, with an expanded mandate and an emphasis on inspection and control through monitoring.

Design and theoretical approach

The study design can be characterised as a configurative mapping with aggregated elements (e.g. Gough, Oliver & Thomas, 2012). The search was thorough and systematic, but makes no claim to be fully comprehensive (the search method is described in its own section). The included studies were based on foundations such as text, rather than on statistical data/register data, and the uniqueness and expanding terminology of the contributions are prominent.

"Practice-based" studies are those relevant to actions on the part of preschool teachers. The focus is on studies *for*, *by* and *with* teachers (e.g. Rönnerman, 2014), although studies *about* teachers' assessments and documentation are also included. The results of the mapping are presented as search results (described and summarised in numbers, tables and text, and assembled in a world map) and analytical results (described and summarised in numbers, tables and text)

The search results are presented in the section on methodology. The analytical results are presented in the section on analytical results – tendencies and configuration.

An expanded ontological and epistemological approach – a basis for a configuration

With respect to the analytical results, an ontological and epistemological approach can be described in terms of text analysis based on an expanded approach (cf. Alvesson & Sköldberg, 2008; Silverman, 2011; Åsberg, 2000/2001). This approach is open to and able to accommodate the breadth of theoretical bases in the material, specifically the shifting theoretical directions and

ontological/epistemological approaches between the social constructionist, post-constructionist and realistic directions. These ontological and epistemological directions represent different grounds for assessment and documentation that appear in the mapped studies. Based on the expanded approach, the analysis culminates in a configuration (compilation). The configuration can be interpreted as being an important point in a review article such as this, which is characterised by being more configurative than aggregating. The configuration, based on the theoretical and ontological/epistemological directions, is exemplified in the section on tendencies and configuration.

Search method

Studies focusing on assessment and documentation in the Scandinavian preschool database "Nordic Base of Early Childhood Education and Care" (NB-ECEC; http://nb-ecec.org/om-projektdatabasen-sv) between 2006 and 2012 were mapped and analysed. The focus was on the inventory in the Scandinavian database, but this was also supplemented by national studies (2006-2014), international research (2013-2014) and several research overviews, as follows:

- SwePub (2006-2014, not included in NB-ECEC); see search results in Table 2 below as well as further information in Table 2, p. 171, Tallberg Broman, 2015 (not reproduced here for reasons of space)
- LIBRIS (2013-2014); see search results in Table 2 below as well as further information in Table 3, p. 172, Tallberg Broman, 2015
- ERIC via Ebsco (2013 only, as at the time of searching, the database did not yet contain any articles from 2014); see search results in Table 2 below as well as further information in Table 4, pp. 173-174, Tallberg Broman, 2015
- ERC – Education Research Complete (2013-2014); see search results in Table 2 below as well as further information in Table 5, pp. 175-176, Tallberg Broman, 2015
- Journals in *Web of Science* and *Ulrichsweb* (searches for journals with a focus on ECE and assessment/evaluation/documentation); see search results in Table 3 below as well as further information in Tables 8-10, pp. 177-179, Tallberg Broman, 2015
- *Web of Science*
  o *Scandinavian Journal of Education Research* (2006-2014, a high-impact Nordic-relevant journal, included in NB-ECEC); see search results in Table 3
- *Educational Assessment Evaluation and Accountability* (a high-impact journal with a focus on assessment but not ECE); see search results in Table 3
- *Ulrichsweb*
  o No journals focused on ECE and assessment/evaluation/documentation
  o 40 journals focused on ECE, 4 of them high-impact
    ▪ *Nordisk barnehageforskning* [Nordic Early Childhood Education Research Journal] (extra search in the entire journal from 2008 to 2014, as at the time of searching, studies from 2012-2014 had not yet been reported in NB-ECEC); see search results in Table 3
- The journal *Forskning om undervisning och lärande* [Research on Education and Learning] (2013-2014, an explicitly practice-based journal with peer-reviewed articles); see search results in Table 3
- The journal *Assessment in Education* (2013-2014, a journal which assessment researchers often cite, but which is not focused on ECE); see search results in Table 3

Research overviews (Swedish National Agency for Education, Swedish Research Council and OECD); see search results in Appendix in Tallberg Broman, 2015, pp. 181-189.

The search work was carried out in close collaboration with a search specialist and librarian at Malmö University, who recommended searching both as free text and by subject block according to the thesaurus. Peer-reviewed articles, doctoral dissertations and research overviews (reports) are included as scientific studies. Studies using both quantitative and qualitative methodological approaches were included in this research review, although qualitative approaches were most prominent.

Search strings and search process

The search strings were:

- The place
  - *Förskola* or preschool or ECEC or ECE or early education or early education and care or pre-kindergarten or pre-primary (focused on preschool with children aged 1-5)
- The phenomenon
  Bedömning-utvärdering/assessment-judgement-evaluation and *dokumentation*/documentation

Place and phenomenon are cited as search words in the search result tables. The search process included four steps: 1) number of hits, 2) number reviewed, 3) selection 1, and 4) selection 2. In other words, first the place (the preschool) was defined, after which the place was combined with the search words defined above, and the number of hits was recorded. After an initial review of the general information provided via the databases (referred to as "reviewed" in the tables), the abstracts derived from the initial review (referred to as "selection 1" in the tables) were read. The reading of the abstracts yielded a number of publications, which were then read in full text (referred to as "selection 2" in the tables). After reading each complete publication, the study was assessed on the basis of its relevance to the purposes and questions of the present study. Selection 2 comprises the studies that were finally included. Some studies were registered in multiple databases, and duplicates could also occur under different subject words/search words in the same database. All duplicates were removed from selection 2, and each study was counted and analysed just once.

This review article is based primarily on NB-ECEC for the years 2006-2012, and the search results from that database are described in greater detail in the following sections (see Table 1).

Search results

This section describes the search process that derived from the various search strings and led to the final search results. A total of 153 studies are included (see Appendix in Tallberg Broman, 2015, pp. 181-189); the majority of these are scientific articles, but dissertations, reports and research overviews are also included.

The NB-ECEC database contains a total of 78 subject words. The subject word "dokumentation" ["documentation"] gave 15 hits in the database, and the subject word "utvärdering" ["evaluation"] gave 16 hits. There are no subject words with the designation "bedömning" ["assessment"], and therefore all subject categories were searched. "Bedömning*"* ["assessment/judgement"] appeared in the titles and purpose descriptions (e.g. language assessment) of four studies and one journal (Journal of Psychoeducational Assessment).

Table 1 presents the combined search results, with 32 studies in selection 2 for the NB-ECEC database. These 32 studies are distributed fairly uniformly over Scandinavia, although Denmark and Sweden account for the most studies, as follows:

- 11 studies from Sweden
- 1 study from Sweden/Finland
- 11 studies from Denmark
- 7 studies from Norway
- 2 international studies

Table 1. Search in NB-ECEC. Place, assessment and documentation between 2006-2012

NB-ECEC database	Search word	Number of hits	Reviewed	Selection 1	Selection 2
S1	Nordic, preschool or ECEC	378 (all in the database)	378 (all in the database)	42 (with focus on assessment/evaluation, documentation)	32
S2	Utvärdering* (Bedömning**)	19	17 (some studies were registered in more than one subject category)	17	17
S3	Dokumentation***	15	15	15	15

* *Utvärdering* = Evaluation, ** *Bedömning* = Assessment, ***Dokumentation = Documentation

Combined search results for databases
Table 2 shows the total number of studies for all databases in selection 2.

Databases	Number of studies in selection 2
NB-ECEC	32
SWEPUB	31
LIBRIS	3
ERIC via EBSCO	11
ERC	49
Total	**126**

Table 2. Number of studies in selection 2 from all databases

Number of articles in the journals
Table 3 shows the number of articles included from each journal.

Journal	Number of articles
Nordisk barnehageforskning [Nordic Early Childhood Education Research Journal]	15
Scandinavian Journal of Educational Research	4
Forskning om undervisning & lärande [Research on Education & Learning]	0
Assessment Evaluation and Accountability	1
Assessment in education	2
Total	**22**

Table 3. Number of articles in journals

Analytical results – tendencies and configuration

This section focuses on the questions: "What (meta)theoretical gateways are featured in research on assessment and documentation in preschool between 2006 and 2014?" and "What does the research indicate about assessment competence in preschool?" The research on assessment and documentation in preschool comprises various perspectives and versions of reality, and may be interpreted as multifaceted and pluralistic. It is difficult to present a cohesive picture, but one possible interpretation of the tendencies that exist is provided below.

It is evident that studies of documentation in preschool, particularly pedagogical documentation, have become more comprehensive in recent years. The research on assessment is more modest, but increased interest in process-based assessment and the assessment of children's knowledge at the individual level can be noted. Scandinavian studies are geared more toward educational activities, while studies outside the Nordic region may be geared toward the assessment of learning outcomes, and standardised and graded forms of assessment (Bennett, 2010; OECD, 2013). At the same time, a tendency toward the co-existence of both orientations (i.e. the assessment of educational activities versus knowledge at the individual level) can be traced in more recent Nordic preschool studies (e.g. Vallberg Roth, 2014; 2015).

What does the research indicate about assessment competence in preschool?
Meeting the need for tools that support critical reflection and action also requires studies that clarify how assessment and documentation are based on their scientific philosophical (ontological and epistemological) grounds. The expanded ontological and epistemological approach can be fruitful as support for reflection and action in a complex reality such as that found in assessment and documentation studies on preschool practices. In these practices, teachers should create the best possible conditions, in relation to objectives of equivalence, for the learning, knowledge and development of each child. These complex practices include assessment and documentation of a variety of diverse experiences, abilities and knowledge-creation processes, which can be illuminated and contained in an expanded approach. Professional assessment can be stabilised through a configurative compilation with an ontological and epistemological basis, which would serve as the foundation for integration of scientific principles with practical work. The following configurative

compilation leads to the alternative concept of "multi-voiced assessment competence" [flerstämmig bedömningskompetens]. The term "multi-voiced" refers to several voices in many keys, which can be translated here as multiple angles and a variety of approaches. Multi-voiced assessment competence can refer to the ability to openly and inclusively reflect, analyse and act on diverse and alternative perspectives, voices and versions of reality.Assessment in documentation based on scientific philosophical variation[2]. "What (meta)theoretical gateways are featured in research on assessment and documentation in preschool between 2006 and 2014?" Ontologically and epistemologically, great variety emerges from the mapped studies. For example, the studies may be placed between social constructionist, post-constructionist and realistic approaches and gateways (cf. Alvesson & Sköldberg, 2008; Åsberg, 2000/2001), with prominent social constructionist grounds in NB-ECEC (e.g. Andersen Østergaard, et al, 2008; Bjervås, 2011; Gjems, 2010). Depending on the approach and gateway, assessment and documentation emerge with a variety of implications. Generally, philosophical grounds are more commonly written about and discussed in studies on documentation (e.g. Dahlberg & Elfström, 2014; Ferraris, 2012/2014, 2013; Lenz Taguchi, 2010/2012; Rintakorpi, Lipponen & Reunamo, 2014) than in studies of assessment. A social constructionist focus is more prominent than a post-constructionist and realistic approach. There is also considerable variation within each scientific philosophical direction, and so this article does not claim to be exhaustive by making a comprehensive list of the studies; rather, the below can be viewed as an initial and sketchy configuration of certain tendencies regarding assessment and documentation based on philosophical variation.

Given that the focus is not on measurement theoretical grounds, the approach can only be addressed here in relation to assessment of the observable, in which the observed is converted into quantitative measurements for statistical processing (cf. Åsberg, 2000/2001). One example of a study based on measurement theory is provided by Ishmine and Tayler (2014), who analysed 11 measurement instruments (most of them American-based, including the Early Childhood Environmental Rating Scale: Revised Edition [ECERS-R] and the Classroom Assessment Scoring System: Revised Edition [CLASS-R]). Measurement technology interests feature prominently in the study, and metrically reliable assessments [mätsäkra bedömningar] are the ideal. Although, for example, ECERS is preferably used as an external measurement instrument, it also appears as an internal instrument in the mapped studies (e.g. Buus, et al, 2012). Hence, the professionals in preschools may be involved in doing assessments with instruments such as ECERS-R and ITERS-R (Infant/Toddler Environment Rating Scale: Revised Edition), both as external and internal arrangements, with preference for metrically reliable assessments (e.g. Baustad, 2012; OECD, 2013; Winsvold & Gulbrandsen, 2009).

Alternative viewpoints include the idea of social constructions, which emphasises that mental traits arise through interaction with people and the environment (Åsberg, 2000/2001). Hence, social constructions should not be studied solely through observable behavior, nor solely by using metrically reliable assessments. This leads to a social constructionist basis for assessment and documentation.

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[2] This section connects to different types of references; both references to the mapped studies, and contextual and method references. References to the mapped studies were chosen to exemplify the variations in studies with significant traces in relation to the philosophical directions. The method references are connected to the description of the different philosophical directions, including Alvesson and Sköldberg, 2008; Barad, 2003; Berger and Luckman, 1966; Ferraris, 2012/2014, 2013; Pramling Samuelsson, 2015; Wertsch, 1991 and Åsberg, 2000/2001. Other contexual references also mentioned in the mapped studies are Säljö, 2000; Osberg and Biesta, 2010; and assessment studies such as Black and Wiliam, 2006; Grettve, Israelsson and Jönsson, 2014; Hattie and Timperley, 2007 and Lindström, 2006.

Social constructionist basis for assessment and documentation

The social constructionist perspective has a long tradition in the social sciences. With the publication of *The Social Construction of Reality. A Treatise in the Sociology of Knowledge*, Berger and Luckmann (1966) launched the concept of social construction, which has since received a wide distribution. The idea of social construction points out that individual and social phenomena ought to be studied via the subjective minds of individuals, not just through observable behavior. This approach has evolved along different primary paths that can accommodate large variations. The social constructionist foundations that are highlighted in this section can preferably be seen to be based on a hermeneutic, critical or postmodern tradition (e.g. Alvesson & Sköldberg, 2008). From this perspective, there is no knowledge to be found beyond the individual's perceptions of reality. Actions and mental processes are interpreted as being the result of social interactions between people. This means that we can only know how people create and understand reality, and their actions within this reality. Language is not seen as a true representation of the individual's mental world, but as something interpreted (e.g. Alvesson & Sköldberg, 2008; Åsberg, 2000/2001).

Constructionist and social constructionist grounds lead to assessment and documentation as construction, control or fabrication (e.g. Alasuutari & Markström, 2011; Andersen Østergaard, et al, 2008; Bjervås, 2011; Basford, & Bath, 2014; Gitz-Johansen, 2012; Gjems, 2010; Löfdahl, 2009, 2014; Pettersvold & Østrem, 2012). Knowledge is viewed as a social construction and not a true representation of reality. It is impossible to attain knowledge that is decoupled from the subject that creates knowledge. Here documentation and assessment involve a textual-discursive relational interaction, with communication and language in the foreground.

For example, in socio-cultural perspectives (e.g. Säljö, 2000; Wertsch, 1991), assessment for learning occurs in interaction and interplay with the surroundings, learning situation and learning environment ("interaction" is one of the most frequent keywords in NB-ECEC[3]). Interest is focused on qualitative assessments based on a multitude of criteria rather than on skills that can be assessed in terms of "right" or "wrong"; feedback is an important element in assessment for learning (e.g. Hattie & Timperley, 2007; Lindström, 2006). One direction in preschool that is linked to sociocultural perspectives (and phenomenography)[4] is developmental pedagogy (Pramling Samuelsson, 2015), "which deals with using everyday life and the surrounding world and where children's attention and interest are drawn toward what they are to learn" (p. 168). Epistemological assumptions and the relational end up in the foreground, and documentation and assessment can then be focused on processes rather than on products. Learning processes are focused on activities and interactions, rather than on individuals as knowledge carriers. The focus is on documentation, feedback and assessment of what children can achieve in collaboration with others in various contexts, and with the help of various tools for thinking and memory support. Complex abilities in relation to the conditions of the activity are documented and assessed over time. On constructionist grounds, the point might be a matter of "multiple means-reliable" assessments [många medelsäkra bedömningar] based on a variety of documentation forms (cf. Black & Wiliam, 2006; Grettve, Israelsson & Jönsson, 2014), rather than "measurement-reliable" assessments that were the ideal on measurement theoretical grounds. With a constructionist basis, all assessments are constructed and seen to be marred by errors, and it is unsafe to rely too heavily on individual assessment occasions. It is considered good to perform several

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[3] The three most common subject words are: Interaction (63), Learning processes (63), and Play (48).
[4] Phenomenography is an approach designed to capture qualitatively different views of a phenomenon. In developmental pedagogy, this is about both distinguishing different ways to learn, and making the variation visible to children (Pramling Samuelsson, 2015).

assessments of the same skills and abilities, but in different ways, so that the teachers have a versatile base to start from. For formative purposes, assessment information is used for the formation of the child to the same extent as for the formation of child's opportunity to learn in educational environments (e.g., Lindberg & Hirsch, 2015).

According to the Swedish National Agency for Education (2012), education researchers today point out that the constructionist focus on interpersonal relationships and social interaction is not sufficient for understanding children's learning. Instead, an alternative basis for educational documentation in the preschool is being introduced:

> "*Post-constructionism:* Today, several educational researchers have noted that constructionism's strong interest in social interactions and interpersonal relationships is not always enough to understand children's learning in preschool. Within constructionist theory, environments, toys and the physical body have been viewed as something that will gain significance through language and people's beliefs. Although materials and environments have always been significant in the educational context, there has been a strong tendency to focus primarily on what is said and done between people. It is easy to forget to notice what is happening between the child and the materials" (The Swedish National Agency for Education, 2012, p. 26).

The result of this is the adoption of a post-constructionist basis for documentation and assessment.

Post-constructionist basis for documentation and assessment

With a post-constructionist gateway, the focus is on notions of what is happening *between* the child and the materials. Being and knowing are united in onto-epistemological relations (see quotation below). Thoughts of nature, being and knowledge creation as fixed, stable entities are abandoned in favour of a constant process of creation and movement. This theoretical gateway, and the related onto-epistemology, is "based on, but further develops and consolidates, constructionism and realism (i.e. a post-constructionist and post-realistic thinking), which together become an agentic realism" (Lenz Taguchi, 2010/2012, p. 25). In this context, reference is made to the physicist Barad (2003) who constructs the concept of "intra-action":

> "The most important concept in agentic realism is 'intra-action' / ... / relationships in which all agents involved in the relationship affect and/or change each other and where it is not possible to clearly show where the boundary between one agent and the other goes" (Lenz Taguchi, 2010/2012, p. 25).

In an onto-epistemological gateway, knowing and being are united, and learning can move here and there in unpredictable paths like rhizomes (root networks like those found in quick grass or fungal mycelium)[5]. Post-constructionist and post-structural[6] gateways (e.g. Lenz Taguchi, 2010/2012;

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[5] The concept of rhizome is borrowed from biology and refers to a plant-root system. The system can grow and spread in different directions, unlike, for example, a tree root that always branches at the ends. Rhizomatic thinking makes it possible to describe how learning, like rhizomes, goes in unpredictable paths, and is in no way linear or progressive. Learning does not follow a linear, pre-mapped route, but moves back and forth in unpredictable paths. (Skolverket [The Swedish National Agency for Education], 2012, p 27).
[6] The post-structural approach refers to theories that have their roots in structuralism. The so-called post-structural thinkers have rejected the notion that the structures are innate and true, and see them instead as changeable and diverse in

Palmer, 2010a, 2010b; National Agency for Education, 2012) can be interpreted as providing support for documentation and assessment as non-linear and co-active processes (e.g. Dahlberg & Elfström, 2014). Here, it is not a question of either "measurement-reliable" or "means-reliable" assessments; rather, the process can involve non-predetermined documentation and open, "non-reliable" assessments [öppna, icke-säkra bedömningar]. The point then is to avoid specifying in advance what will be assessed and how this assessment will take place, leaving ourselves open to the possibility that something valuable can appear that we could not foresee (see Osberg & Biesta, 2010). Open, non-reliable assessment can, for example, be seen as the support point for non-linear potential in creative processes. This is exemplified in documentation about children's ideas on "mold music" (Elfström, 2013, p. 146). Hence, the documentation visualises and values ideas that could not have been forseen. The point of the documentation is to support and value the flow of ideas that belong to the group of children, that may create a relational field of potential between children, teachers, materials and subject of the inquiry (ibid). Another example of documentation and valuation in socio-material co-action is when children become "mud researchers". This is an example of narrative assessment in documentation of the children becoming different in themselves in a socio-material process, in a relation between children and mud (The Swedish National Agency for Education, 2012).

> "If we compare the first occasion with the second, we can also in this narrative clearly see that the children were not "mud researching" children in the first sequence, even though one of the children says she "loves mud", but quickly became different in themselves – became "mud researchers" – when the activity was changed on the second occasion" (The Swedish National Agency for Education, 2012, p. 38).

Post-constructionist and post-realistic thinking leads to a restrained realism with a focus on documentality. This makes a distinction between being (ontology) and knowing (epistemology), and criticises postmodernist theory that questions concepts such as "facts" and "truth".

Restrained realism as a basis for documentation and assessment
Realism, in the form of a restrained realism and moderate constructionism (Ferraris' version, 2012/2014), can place documentality and registration in the foreground (see e.g. Rintakorpi, Lipponen & Reunamo, 2014). This realism can also provide support for the assessment of moderate claims to truth; in other words, the feedback on facts and the assessment of what may be true or false[7]. Ferraris (2012/2014, 2013) formulates an ontology of social objects based on registration and documentality. With documentality, the registration itself ends up in the foreground: "... We are in a society of registration" (Ferraris, 2013, p. 179). Ferraris holds that social objects differ from natural objects, and that an inner world (inside concept frameworks) differs from an outer world (outside concept frameworks). Being and knowing can be separated (unlike in post-constructionism), and being, which is related to the external world, cannot be corrected with the power of thought (Ferraris, 2012/2014). So with realism as a base, autonomy and the distinction between being and knowing end up in the

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differentsocio-historical contexts (Lenz Taguchi, 2010/2012). Post-structural theory, like its approach to knowledge, is in constant motion and becoming (Elfström, 2013). In recent years, it has developed in different directions that go under names such as post-constructionist and post-humanist approaches (e.g. Elfström, 2013; Lenz Taguchi, 2010/2012; Lind, 2010; Palmer, 2010a, 2010b – see references in Appendix in Tallberg Broman, 2015, pp. 181-189).

[7] Ferraris (2012/2014) makes a thought experiment of bidding farewell to the truth. If we bid farewell to the truth, the following statements are made possible: "'The sun revolves around the earth'; '2 + 2 = 5'; 'Foucault is the author of Faust'; / ... / If we move from the farcical to the tragic. 'The Holocaust is an invention of the Jews'. Since these claims follow naturally from the acceptance of the thesis that there are no facts, but only interpretations" (p. 106).

foreground, instead of the relational (ibid). The ontological experience of preschool children can serve here as an initial example. Children experience that they become wet from water, and this cannot be regarded as construction, in the sense that it is not possible to correct reality with the power of thought; thinking cannot prevent children from getting wet when they put their hands in water. Reality does not change in the sense of the concept framework, constructions or representations, and the experience "can occur without communication, documentation or linguistic articulation" (ibid, p 66). Assessment and feedback on possible questions from children, such as whether the sun enters the sea when it sets, whether the earth revolves around the sun, whether 1 apple + 1 apple = 3 apples, will then allow feedback on factual questions of truth claims. Here, it is not a matter of "measurement-reliable", "means-reliable" or "non-reliable" assessments, but rather of reliable assessments, in the sense that they are reliable over time without being measured. This may be related to studies (cf. Thulin, 2011) showing that children's questions about science remain unanswered in preschool. The teachers often bounce back children's questions in terms of "What do you think?" (p. 99), or may relativise their questions as something that can be interpreted in different ways in the sense that there is no "right" or "wrong" answer (everything is constructed). A question arising in this context is whether the teachers seem to be basing their work on constructionist rather than on realistic grounds.

Assessment competence on scientific philosophical grounds
It is important for professionals to be able to identify, execute, analyse and critically reflect on their own and others' assessments in texts and practice, and to be able to argue for and communicate their choice of assessments and forms of feedback based on ontological and epistemological grounds. This is important as a tool to analyse how different philosophical grounds are home to and enable the assessment of knowledge and experience, both as facts and interpretations/constructions, but also as non-linear knowledge-creation processes. As a professional, it is also desirable to make assessments based on a variety of theories to capture the experience and knowledge in various complex and interacting forms that include every child's learning and creation of equal quality work. "Knowledge is a complex concept, which can be expressed in a variety of forms – as facts, understanding, skills, familiarity and experience – all of which presuppose and interact with each other. The starting point for the preschool is the experience children have already gained, their interests, motivation and their drive to acquire knowledge." (Lpfö 98, 2010, p. 6). In relation to policy documents, on legal grounds, "legally reliable" [rättssäkra] and equivalent assessments can also be considered (cf. Swedish School Inspectorate reports). This means that there is a legal protection regime that provides individual protection against abuse from other individuals and society. Hence, making legally reliable and reasonable equivalent assessments means following national policy documents and regulations. In this sense, assessment of personal qualities in children, so-called "person-assessment", is for example interpreted to be irrelevant and not considered as a legally reliable assessment; the national goals do not include personal qualities such as kindness, harmoniousness, or calmness (e.g. Vallberg Roth, 2015). In summary, teachers and professionals in the mapped studies can be seen as being involved in practices that include "legally reliable", "measurement-reliable", "means-reliable", "non-reliable" and "reliable" assessments.

Conclusions

Scandinavian preschools have traditionally attracted strong international interest. It is less easy to form an opinion on issues of research with respect to assessment in documentation. Assessment research is still a relatively young and undeveloped field, while the field of documentation and, in particular,

research on pedagogical documentation has a significantly higher standing (cf. Swedish Research Council, 2014).

As more and more different forms of assessment and documentation assume their place in preschools, it becomes increasingly important to gain knowledge and awareness of the potential benefits, limitations and consequences of various forms and practices for assessment and documentation. Theoretical gateways vary, as do the forms of assessment and documentation used. A critical reflection on the search and search results is necessary, due to the fact that the literature searches were heavily weighted toward Scandinavian literature and generally mirrored the Scandinavian/Swedish field rather than the international field. It should also, once again, be stressed that in a configuratively focused article such as this one, where the uniqueness of the studies makes them difficult to present coherently, the present analysis is just one of many possible ways to analyse and compile the results. Hence, it is not possible to capture the uniqueness of each study in this research review, and only possible to be transparent in showing each unique reference in the Appendix (in Tallberg Broman, 2015, pp. 181-189). This also allows the reader to check the credibility of the interpretations and to further view each study's uniqueness.

The variation in the mapped studies may be perceived as both a strength and a weakness. The strength lies in diversity, and in the ability to capture the phenomenon from many different angles in a composite picture. The weakness lies in relating different types of research to one another. Studies which address different theoretical gateways, methods and forms in a state of mutual tension are rare, reducing the possibilities for broadening and deepening. Further developing assessment and documentation practices among professionals in relation to a multidisciplinary philosophical domicile could stabilise, map and deepen the field, and help professionals to expand their competence and opportunities for making use of their freedom of action.

Assessment competence – significant gaps, and ideas for where research might go next

Regarding the issue of assessment competence in preschool and how research meets the need for tools for assessment and documentation in Scandinavian preschools, the analysis shows signs that the research does not seem to be really in keeping with the times. Regarding the expanded documentation and evaluation task and the preschool's complex assessment and documentation practices, there is a need for both expanded research and expanded competence, which can focus on a multi-voiced assessment competence. The above-described tendencies and configurative compilation, conceptualised in such a multi-voiced assessment competence, can bridge the gap between the analytical results of the studies included here and ideas for where research might go next. In other words, the configuration can indicate the tendencies and tensions in the field and at the same time open up possibilities to use assessment and documentation within different research traditions. In their complex assessment and documentation practices, the professionals may then transpose and move between different scientific philosophies. Hence, the analysis indicates that assessment competence can include professional assessment based on a variety of scientific grounds. The configuration can thereby serve as an index of the actual and the possible, and act as a kind of bridge between the starting point in these studies and forward-looking opportunities, while incorporating criticism of significant gaps in the research. There is a need for further research and elucidation of teachers' *multi-voiced assessment competence.*

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