
*Inclusion of Children with Special Educational Needs*
*Интеграция на деца със специални образователни потребности*

# ECOLOGICAL SYSTEMS THEORY: A VALUABLE FRAMEWORK FOR RESEARCH ON INCLUSION AND SPECIAL EDUCATIONAL NEEDS/DISABILITIES

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**Abstract.** In this article I critically discuss some of the benefits and limitations of using Ecological Systems Theory (EST) in research on Inclusion and Special Educational Needs/Disabilities (SEN/D). In support for this discussion I draw on reflections from a study I conducted on the social inclusion and participation of young people with dual sensory impairment in mainstream schools (author, 2012). The aim was to explore to what extent the young people were socially included in the mainstream environment and to identify any barriers to their participation. I used EST (Bronfenbrenner, 1979) as the theoretical framework for the study and accordingly perceived the mainstream school as a system, components of which continuously interact and influence social inclusion. The aim of this article is to argue that the conceptual framework of EST is a valuable tool for research exploring inclusion in education of learners with SEN/D, because it helps the researcher focus on the crucial interplay between the individual and the context, in which the individual is embedded. Challenges for researchers adopting this framework are also considered.

*Keywords:* ecological systems theory, qualitative research, inclusive education, special educational needs, disabilities

## Introduction: Ecological Systems Theory

Ecological systems theory (EST) is a well-known psychological theory of human development. Based on General Systems Theory, according to which all living organisms can be fully understood and explored only as the result of continuous and complex interactions between their component elements (von Bertalanffy, 1972),

Urie Bronfenbrenner developed EST in relation to human development (1979). Accordingly, he argued that each human being can be perceived as embedded in multiple nested systems, and that development is the result of complex interactions between the individual and various systemic factors or components that influence each other. The different systems that Brofenbrenner proposed are summarised in Table 1. From Brofenbrenner's conseptualisation, it follows that human development depends on the complex interactive processes between numerous systemic or contextual factors. It is also relevant to stress that within this theoretical framework, development is defined as *'the person's evolving conception of the ecological environment, and his relation to it'* (Ibid; p.9), thus placing emphasis on the person's changing and subjective understandings and interpretations of the different contexts/systems.

**Table 1.** Summary of systems proposed by Brofenbrenner

| System | Explanation |
|---|---|
| **Micro-system** | The immediate contexts in which the individual participates and the people in these contexts in direct contact with the individual. |
| **Meso-system** | Influences between members of the micro-systems, e.g. school and family relationships. |
| **Exo-system** | External influences on the individual from systems not directly related with or external to the micro-system, e.g. policy and legislation. |
| **Macro-system** | Broader cultural and social influences, e.g. social and economic status. |
| **Chrono-system** | Changes in all systems and their members across time. |

Unsurprisingly, EST has been influential on research concerned with child development (Lerner, 2005). It should be noted that initially EST emphasised the role of the *micro-system*, which generated a significant number of studies on families and a more limited body of research on school settings that tended to over-emphasise contextual factors and paid less attention to the role of individual differences (Sontag, 1996). In response to this, the theory was revisited in the early 1990s by Bronfenbrenner and his colleagues (Lerner, 2005) and the term *'bio-ecological'* was introduced (Bronfenbrenner, 2005), thus emhpasising again the central influence that the bio-system (i.e. the individual's characteristics) has on development, and hence the need to consider the role of individual differences in developmental outcomes.

**EST as a theoretical framework for research on Inclusion and SEN/D**

The need to consider the role of individual differences is of crucial relevance to inclusion research. Lawson et al. (2006) have argued that research on inclusion

is inevitably about social justice and that such research should be able to capture individual differences and multiple interpretations. In a recent article I co-authored (Kamenopoulou et al., 2015), I argued for the need to employ flexible qualitative approaches in Inclusion and SEN/D research and consequently, the need for researchers to refrain from psychologically informed research designs that focus on measurement and assessment. Simply put, given the relevance of individual differences in SEN/D, it seems imperative for researchers to avoid approaches that assume a shared understanding of complex concepts (like SEN) and an objective understanding of complex phenomena (like inclusion), and leave little room for different perspectives and interpretations (Lawson et al., 2006). This is especially relevant in research on populations of SEN/D that are small and heterogeneous, whereby it is impossible to attempt to generalise by using large numbers of research participants and standardised measuring instruments.

With its focus on the continuous interactions between individual and systemic factors, the EST approach is aligned more with the sociological position on SEN less with the psychological position (Barton, 1988 cited in Mintz and Wyse, 2014):

*'In psychological orientations, at least in Barton's analysis, [knowledge of SEN] is conceived of [as] showing us how we can make up the deficit between the typical population and the population in the sub-category, so that they can come closer to meeting particular outcomes considered desirable in the education system.'* (Mintz & Wyse, 2014).

When adopted as a framework for research on Inclusion and SEN/D, EST can help the researcher stay aligned with the sociological position on SEN/D, which:

*'[…] deconstructs outcome as a mode of objectification, which is produced as an interaction of individual and system.'* (Mintz & Wyse, 2014).

For this deconstruction to take place, methodological flexibility is warranted in order for the research to be able to capture complex outcomes and phenomena. EST is compatible with qualitative methodologies since it stresses the need to focus on interactions between various factors and within different contexts, and is particularly in line with the case study approach that aims for a close scrutiny of the complex factors relating to the phenomenon studied (Yin, 2003). This is important when the phenomenon/concept in question is as complex and multidimensional as Inclusion is argued to be (Erten & Savage, 2011).

Thus adopting EST can be a useful theoretical framework for research exploring inclusion and SEN/D, because it enables the consideration of various factors, both internal and external to the child, which may interact and influence inclusion. It moreover helps the researcher focus on the context of the phenomenon in question. Llewellyn and Hogan (2000) support this view arguing that EST can be useful in naturalistic case study research on disability that aims to explore development in relation to real-life contexts.

EST has informed research on inclusion and SEN/D as a conceptual framework for the synthesis of literature reviews (Odom et al., 1998; Odom et al., 2004); and

as a conceptual framework informing research designs (Foster & DeCaro, 1991). For example, Foster and DeCaro (1991) conducted an ethnographic study of social interactions between deaf and hearing students within a university hall of residence, using participant observation and in-depth interviews. For the organisation of the rich data an EST model was used. The authors concluded that factors within the individuals, such as communication skills, knowledge of one another and attitude towards one another, as well as environmental factors, such as the physical setting and the campus organisation, both affected the number and nature of peer interactions. Concerning the physical setting, for instance, bad lighting conditions were found to impede interactions based on lip-reading. The next section presents an innovative approach, namely the use of EST as the conceptual and exploratory framework for a research on dual sensory impairment and inclusion and discusses the specific rationale behind this idea.

**EST as a theoretical framework for a research on Inclusion and dual sensory impairment**

***Rationale***

The idea of using EST as a theoretical framework for a research exploring the social inclusion of young people with dual sensory impairment in mainstream schools (for a summary of the research including the key findings, see author, 2012) originated from a review of literature in relation to the development of children with a single and/or dual sensory impairment that pointed to the reciprocal nature of their interactions. This is in line with the EST framework that perceives interactions and relationships as *'two-directional'* (Bronfenbrenner, 1979) and reciprocal, which means that successful interactions depend on both interactive partners.

When early interactions of children with dual sensory impairment are conceptualised from the perspective of EST, the role of reciprocity becomes evident. Drawing on the central idea that the child is part of nested systems, the first system in which development occurs is the family and the first interactions in which the infant participates are interactions with the mother/primary caregiver. Because language is not developed yet, in the case of typically developing infants such interactions involve social behaviours that require mutual exchange of visual and auditory information, such as eye contact, smiling, pointing at objects and vocalisations (Webster and Roe, 1998). It thus seems safe to argue that the extent to which an infant with a sensory loss can attend and respond to cues from the caregiver will depend on the amount of residual vision or hearing and the type of visual or hearing loss, i.e. within-child or bio-system factors. However, at the same time early observational studies of blind infants and their mothers (Fraiberg, 1977) suggest that although significant, the barriers put by lack of vision during early interactions may be overcome if the communication partner employs strategies that make use of the baby's intact channels of communication (e.g. touch and smell). The same can be argued in relation to hearing impairment.

Those babies with impairment in both distance senses however cannot make use of their hearing to compensate for their visual loss or their vision to compensate for their hearing loss during interactions. Hence when two channels of communication are impaired, it follows that the possible compensatory strategies that the interactive partner can use are reduced, which complicates early interactions in a unique way (Meshcheriakov, 1979). It is useful to remember though that total absence of both distance senses i.e. total deafblindness is rarely the case (Miller & Hodges, 2005), and consequently it is still crucial that the interactive partner is able to make use of the appropriate strategies to support and sustain early interactions with a child who has a dual sensory impairment (Pease, 2000). In addition, from an EST perspective several other factors relating to the micro-systems can be highlighted, such as for example the emotional pressure felt by parents and siblings (Aitken, 2000), which might contribute towards circumstances within the family micro-system, in which child may not be able to develop to their fullest potential.

In summary, according to the literature, the social development of children with a single/dual sensory loss from birth is shaped by the interaction between their unique characteristics or bio-system (e.g. severity of impairments; character traits) and other systemic factors (e.g. the interactive partner's skills; other characteristics of the micro-systems in which they are embedded). This highlights the complexity and fragility of social interactions and relationships of these children, but also creates a framework for research, according to which these interactions and relationships can be perceived as reciprocal, in line with EST that points to the need to consider both the child's needs and other systemic factors that are external to the child. This supports the relevance of adopting EST as a theoretical framework when exploring social inclusion of children with complex SEN/D.

In the next section, I explain the specific ways in which I used the theoretical model of EST for my research exploring the social inclusion of young people with dual sensory loss in mainstream schools. I will demonstrate how EST influenced key stages of the research, including the review of the literature, the design of the research (with reference to data collection and analysis), and the organisation and interpretation of findings. It is useful to reiterate that a summary of the research, including the key findings and implications for practice has been published elsewhere (Kamenopoulou, 2012).

***How EST informed the literature review***

EST informed the literature review in two ways. Firstly, it was used as a guiding framework for the critical review of existing research on social inclusion and SEN/D and for the synthesis of findings from previous studies into a coherent summary. As mentioned previously, other literature reviews on inclusion have used the same framework as a way of conceptualising and categorising previous research findings (Odom et al., 1998; Odom et al., 2004). Accordingly, previous research studies were grouped into the following three categories:

1. Studies pointing to individual factors, i.e. focus on the young person's bio-system, e.g. degree and type of disabilities, method of communication (Romer &Haring, 1994).

2. Studies pointing to contextual factors, i.e. focus on school system variables such as teaching strategies, teaching style, peers, and structure of daily schedule (Moller & Danermark (2007).

3. Studies pointing to both individual and contextual factors (Arndt et al, 2004).

Secondly, having informed the review of the literature, EST informed my thinking about the second research aim, namely, to identify factors influencing their social inclusion (i.e. barriers and facilitators). According to EST, the focus would be on both the role of the bio-system of the young person and that of different micro-systemic factors. Due to the focus of the study (and other practical and time constraints), more weight was placed on the school system rather than on the family and the wider social context for example, but data collection techniques were flexible enough to be able to at least capture such themes if they arose. Finally, meso-system factors were to be taken into consideration, especially the interactions between members of the micro-systems (e.g. teaching staff and parents).

***How EST informed the research design***

The approach adopted had elements of the case study methodology. Data was primarily gathered with the use of one-to-one semi-structured interviews with the teachers, the parents and the young people. A semi-structured questionnaire was also administered to the teachers as a supplementary method of data collection prior to their interview to facilitate the gathering of background information. Finally, direct observations with the use of a semi-structured tool were conducted of the young people's interactions with peers in the school setting.

The aim of the methodology adopted was to explore multiple perspectives in line with EST that stresses the role of subjectivity and thus the need to include the perspectives of different people (Bronfenbrenner, 1979). EST moreover argues that different members of a system (in this case, parents and teachers) can affect developmental outcomes (in this case, social inclusion). The adults' perspective was necessary for providing an insight into their own perceptions of the young people both in relation to their peers and in relation to themselves. In addition, by including their voices, the role of teachers and parents in shaping the young people's social outcomes, as well as the challenges faced by them were also explored. Similarly, from an EST perspective it would be an omission not to seek the young people's views, as they too play a substantial part in interactions, thus shaping the degree to which they experience social inclusion or exclusion. It should be acknowledged that the voices of their peers would also have been useful to include, but it was not deemed ethical to employ a methodology that would risk making the young people feel singled out from their peers.

Finally, conducting observations was compatible with EST that stresses the need to explore each phenomenon (in this case, social inclusion) in relation to the system in which it is embedded (in this case, school). Hence the observations focused on peer interactions occurring in the school during breaks, i.e. periods during which pupils are free to mix and socialise with their peers in a natural way.

During data analysis, I adopted both an inductive and a deductive approach (Robson, 2011). I looked for themes and categories derived from the literature and the theoretical framework of EST, while at the same time being careful not to ignore findings unexpectedly emerging from the data (Denzin & Lincoln, 2011). However the deductive approach was predominantly followed in line with EST that emphasises that similar to the participants, the researcher also has his/her own perspective of reality (Bronfenbrenner, 1979) and that s/he therefore influences the way data are gathered, analysed and subsequently interpreted.

***How EST informed the interpretation of findings***

EST was used as a conceptual tool for the interpretation of findings relating to facilitators of and barriers to social inclusion. As explained earlier, EST helps emphasise the interaction between individual and contextual factors, because *'it is a person-context model which permits analysis of […] outcomes as a joint function of the environment and the person'* (Llewellyn & Hogan, 2000). As a result, the analysis of factors influencing social inclusion pointed to the role of the individual, but at the same time, the context also emerged as important. The patterns emerging from the case studies concerning facilitators of and barriers to inclusion were constructed from an EST perspective, and accordingly, facilitators and barriers were grouped by their relevance to different systems.

The bio-system of the young person such as their level of sensory loss or personal traits emerged as important, but at the same time several factors within the school micro-system were perceived by participants as influencing the young people's social participation (see Table 2). Meso-system factors, such as the relationship of the family with teachers and other professionals were also explored, and parental involvement emerged from the interviews as a crucial issue. All meso-system factors are summarised in Table 3.

**Table 2.** Themes relevant to school micro-system factors and influences

| **Case** | Common theme emerging |
|---|---|
| **Cases 1 and 2** | Grouping arrangements and group dynamics influence pupil's confidence and opportunities to interact. |
| **Cases 3 and 4** | Withdrawal practices and one-to-one support seen as reducing opportunities for peer interaction. |

**Table 3.** Themes relevant to meso-system factors and influences

| **Case** | Emerging theme |
|---|---|
| **Cases 1, 2, 3** | Barriers to parental involvement:<br>– Parents seen by school staff as disengaged and hard- to-reach; school staff spoke about cultural and language barriers (Case 1)<br>– Parents saw school staff as unhelpful in terms of bullying experienced by the pupil (Case 2)<br>– Parents seen by school staff as lacking the skills necessary to be able to advocate for their child's needs (Case 3) |
| **Case 4** | Smooth parental involvement: parents actively involved in educational decisions and choice of provision thus resulting in smooth home-school collaboration. |

Interestingly, it also emerged how individual and context may interact and shape social inclusion over the course of time. For example, it was stressed by participants that factors relating to the bio-system, such as the young person's current level of social skills, were also influenced by systems experienced previously, such as previous placement in a special school:

> S*he came in September from a special school and sometimes we notice when children come from that particular school, because there is so much support there, students may find it difficult, you know may be very dependent in the early days.*
>
> (Teacher)

Furthermore, the barriers caused by dual sensory impairment were also found to be dependent upon the use of appropriate communicative strategies by others. For example:

> *Especially my closest friends, they know they have to have their face to me, they can't just turn around and speak to me, speak loudly and use their lips as well, which generally they do, and they understand if I go "pardon" or "what?" or "say that again", they're quite patient with it.*
>
> (Young person)

To sum up, with the use of EST as a theoretical tool guiding data interpretation, it was possible to highlight a range of barriers and facilitators of Inclusion relating both to the school system and to the young people's needs and characteristics. More importantly it was possible to maintain a focus on the interaction between individual and contextual factors throughout and in this way to better understand the similarities and differences found between the young people in terms of their social inclusion. The section that follows provides a critical reflection on adopting EST as a theoretical framework for this research.

**Evaluation of EST as a theoretical tool for research on Inclusion and directions for future research**

The main advantage of adopting EST as a theoretical framework for this research was the focus on the interaction between factors both internal and external to the individual. Llewellyn and Hogan (2000) argue for the usefulness of the EST model if applied to disability research, stressing this very emphasis on interactions between individual and context, in which the individual is embedded. This clearly reflects the sociological position on SEN (Barton, 1988) and calls for researchers to explore multiple factors within and across systems thus rejecting the 'either/or' question concerning the degree to which outcomes depend on the individual or the context. Several scholars (Reindal, 2008; Frederickson and Cline, 2009) have argued for a need to move away from traditional conceptualisations of SEN/D, namely the medical and the social models of disability that place emphasis on either the individual or the social context respectively. Hence the EST framework can help avoid both the over-individualisation and the over-socialisation of SEN/D.

Moreover, the perception of the ecological environment as *'a nested arrangement of concentric structures, each contained within the next'* (Bronfenbrenner, 1979), allowed the consideration of factors beyond the immediate settings in which the young people were embedded. Thus if adopted for the exploration of inclusion, EST can capture a multiplicity of factors, and can help focus on the interplay between individual and contextual characteristics, the latter being either those of the immediate context or those of contexts such as the macro-system and the exo-system, which the researcher may not be able to directly access. Hence this theoretical approach is suitable for the exploration of inclusion in education, because it permits the consideration of multiple interconnected and interdependent factors directly or indirectly related to the individual, which may be influencing their inclusion.

On the other hand, one of the criticisms of EST is the huge pressure it can place on the researcher in terms of having to consider multiple factors and all the possible interactions between them (Sontag, 1996). Essentially, this model presents researchers with the challenge of setting up a multidimensional research design in order to explore multiple systemic factors, because *'[...] to use ecology systems model as a theoretical framework would require researchers to examine the associations of variables and impacts across levels of the system'* (Odom et al., 2004). Moreover, factors within a system interact with each other, but also with factors of other systems, in which the individual is also embedded. The simultaneous exploration of more than one or two systems and of the complex linkages between them is admittedly a challenging task for the researcher (Sontag, 1996), who might need to be selective in terms of the number of systems and systemic factors targeted by the study.

In the research described in the previous sections, the micro-system of the school and to some extent that of the family and of the wider context, as well as certain bio-system and meso-system factors were explored. The rest of the systems proposed by Bronfenbrenner (1979; 2005) as well as the links between them could not be addressed for practical reasons. For example, the role of exo-system factors, such as policy and legislation, were not addressed, and it is acknowledged that they had relevance to the questions of the research. Similarly, the role of the macro-system, including cultural and social influences, such as language and culture, and the role of chrono-system variables (i.e., changes in systems across time) was not the direct focus. However, with the adoption of EST, such themes emerged and were highlighted where relevant. It is useful to remember too that Bronfenbrenner (1979) maintains that *'it is neither necessary nor possible to meet all the criteria for ecological research within a single investigation'* (p.14). Consequently, there are various possible approaches to research when using the EST model (Bronfenbrenner & Morris, 1998) and in this article I described one such possible approach. Future research could work towards the development of research designs suitable for directly addressing the role of more systems and systemic factors when exploring inclusion of children and young people with SEN/D.

**Conclusive comments**

Despite its limitations, the conceptual framework of EST proved to be valuable for a naturalistic, exploratory study on the social outcomes of mainstream placement of pupils with dual sensory impairment. The adoption of EST made it possible to perceive difficulties in social interactions and relationships as a result of the imbalance between features of the context and the unique characteristics of these young people, thus arguing for the need to explore the role of multiple factors in order to better foster inclusion. In other words, it emerged that despite the differences between the young people, their common point was not dual sensory impairment, but the interplay between their needs and the features of the mainstream context in which they were embedded.

In reflection, it can be argued that EST is suitable as a theoretical framework for the exploration of the outcomes of mainstream placement of other groups of pupils with SEN/D, especially those who belong to small and heterogeneous populations, because it helps emphasise the crucial interplay between their very specific individual characteristics and those of the context in which they are embedded. EST can therefore allow an open-minded approach to researching inclusion of pupils with complex SEN/D and the factors that may be influencing it, that is, without placing too much emphasis on either individual or contextual factors.

In conclusion, EST can be an invaluable tool for research on inclusion of pupils with SEN/D in education because it allows the exploration of a complex phenomenon in context. By maintaining the focus on both individual and contextual factors, as well as the ways in which they influence each other, studies based on EST can help

researchers (and practitioners alike) better explore ways of supporting the inclusion of those children and young people whose complex individual characteristics place them at a disadvantaged position in both school and society.

**NOTES**

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