

Resource-Centered Human Development Model: A Conceptual Framework for Creating Alternative Capabilities

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Abstract

People with intellectual disabilities face environmental barriers every day, which may prevent them from acting independently and fully participating in social life. Environmental accommodations can play a major role for improving their autonomy and social participation level; however, regarding the cognitive design things may become complicated quickly. Bringing about an effective enabling assistance design to be used by people with intellectual disabilities could be a major contribution in guiding a thorough design of universally accessible living environments. In fact, it can foster accommodations useful for the whole population, especially for cognitively impaired elderly people.

Designing enabling assistance requires understanding people's difficulties to access information, that is, to read, understand and learn. Most of the existing researches in this field are based on the "disability creation process" (e.g. Fougeyrollas, 1998; Fougeyrollas, Chartier, Bergeron, Cote, Cote, Saint-Michel, & Blouin, 1998; Fougeyrollas, Noreau, Bergeron, Cloutier, Dion, & St-Michel, 1998; Fougeyrollas, & Robin, 2013; World Health Organization -WHO, 2002; Fougeyrollas, 2010) to explain how environmental features, in interaction with individual's impairments, may hinder or prevent the achievement of an activity (e.g. Beaulieu & Langevin, 2014). Nevertheless, there is no model to explain how to develop and promote enabling situations that empower people in developing their capacities for adaptation to their environment. This article aims then at contributing to knowledge regarding this topic. Our approach draws on knowledge from Psychology, Ergonomics, Special Education as well as Economics.

In this paper, we present a model, which explains how environmental elements can become resourceful when they are aligned with cognitive features of people with intellectual disabilities. We called this model "Resources-centered Human Development Model" – R-HDM.

Keywords: R-HDM, Human Development, intellectual disabilities, resourceful design.

Introduction

“We know that equality of individual ability has never existed and never will, but we do insist that equality of opportunity still must be sought.”

Franklin D. Roosevelt

The allocation of resources can help to reduce disparities in social participation (Levasseur, Vanasse, Courteau, Généreux, Cohen, & Kestens, 2012) by enabling individuals to respond appropriately to a situation. For Nosulenko and Rabardel (2007), personal resources enable people to interact with the world fostering individual development. However, efforts to reduce inequalities through distribution of resources, either on the basis of equality (resourcist approach, e.g. Verhoeven, Oriane, & Dupriez, 2007; Bonvin & Farvaque, 2007) or on the basis of the usefulness (utilitarian approach to resources), is not enough to ensure their use and a consequent improvement of the individual’s capacities. Besides, the constraints on individuals are not always connected with a lack of resources. These may also result from not having the means to recognize and coordinate relevant resources. Then, how can we help an individual, especially with intellectual disabilities, to organize and develop coherent and effective behaviour for achieving personal objectives according to contextual conditions?

Based on Fougeyrollas’ model (Fougeyrollas, et al., 1998), the World Health Organization (WHO) proposed an International Classification of Functioning Disabilities and Handicaps (ICF) to clarify the relationship between individual factors and socio-environmental factors (WHO, 2002). Nevertheless, these models do not agree on the place of individual and the role of activity, and “do not incorporate choices and personal goals” (Bonvin, 2012; Mitra, 2014). Moreover, if everyone agrees on the role of resources, they do not “distinguish between the environment and resources” (Mitra, 2014). To address these issues, we developed a model, which explains how environmental elements can become resourceful when they are aligned with cognitive features of people with intellectual disabilities, by elimination of barriers factors and addition of facilitators. We called this model “Resources-centered Human Development Model” – R-HDM. Our research is based on a constructivist approach for the consideration of people’s needs variability and the self-determination principles. We consider an environment which fosters self-determination as an environment that provides opportunities to people to be autonomous and act independently (i.e. make free and informed choices) (Lachapelle & Boisvert, 1999).

This paper is divided into three main sections. The first section presents our research problem and objectives. The next section clarifies the concept of resources and resourceful environments and presents our design method. The last section describes the Resources-centered Human Development Model (R-HDM).

Research Problem and objectives From *Disability Creation Process* to *Capability Creation Process*

The Human Development Model or “Disability Creation Process” (Figure 1), developed by Fougeyrollas (2010), allows explaining situations where people experience disabilities by highlighting the factors whose interaction may hinder or prevent the achievement of an activity. However, no description of this interaction process is proposed. That is why we developed a Resources-centered Human Development Model (R-HDM).

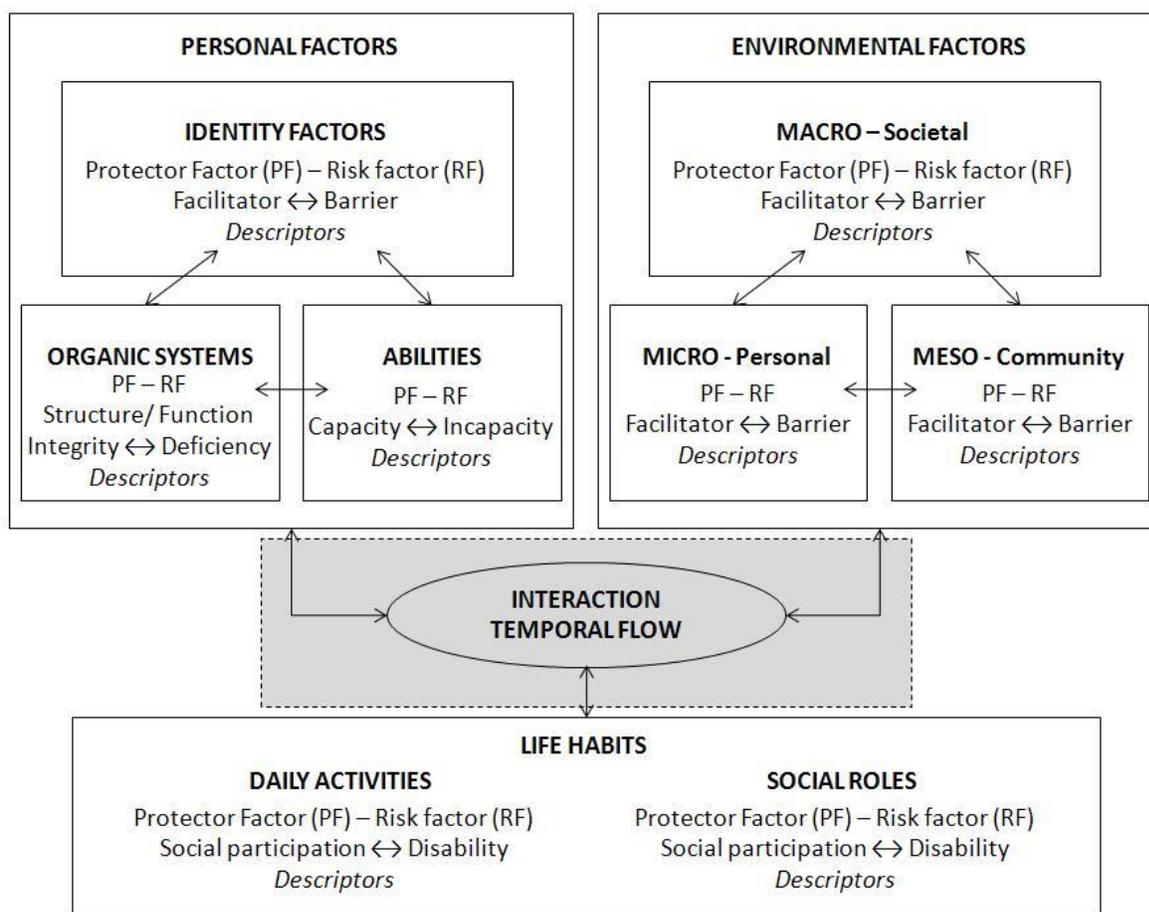


Figure 1 Disability creation process, called “MDH-PPH” (Fougeyrollas, 2010)

Contrary to Fougeyrollas’ model, R-HDM aims at explaining how environmental features, in interaction with individual’s impairments, may make people more competent by creating alternative capabilities. We consider a competent individual as defined by Delignières and Duret (1995), as “someone who has a structured and coherent set of resources showing its effectiveness in a field of social activity”. Moreover, we acknowledge that competencies depend on three factors identified by Le Boterf (2002): knowing how to act, the will to act, and the power to act. Knowing how to act (which is, for Le Boterf, an essential characteristic of autonomy) refers “to knowing how to combine and mobilize relevant resources”. The will to act encompasses

“individual’s motivation and the existence of a more or less incentive context”. The power to act refers to rights and actual possibilities to act securely in a particular context. R-HDM aims at improving these three factors. To do that, we developed a conceptual framework drawing on Fougeyrollas’ model (2010) and knowledge from Psychology, Ergonomics, Special Education as well as Economics.

Psychology and Ergonomics knowledge facilitate use, relevance and appropriation of resources (i.e., usefulness, usability and acceptability), and describe people’s activity in a particular context (e.g. Leplat, 1997). They also allow to assess the opportunities or possibilities of individual action (i.e., substitutive resources) when normal resources are inaccessible or absent (e.g. Rabardel & Bourmaud, 2003). Special education knowledge refers to pedagogical considerations (i.e., teaching, didactic and learning issues) to implement for reducing or limiting environmental barriers for people with specific needs. Finally, Economics knowledge shows how resources can provide people with actual opportunities of action (i.e, related to the cost-benefit evaluation) making free and informed choices (e.g. Sen, 1999).

Resources and resourceful design: concepts and method

Definitions

Resources issues are widely discussed in the literature (e.g. Leca & Billard, 2005, Rézeau, 2001, Recopé, 1990, Famose, 1983, Delignières, et al., 1995; Le Boterf, 2002). Nevertheless, existing definitions are mainly related to a specific area of research (i.e., sports education, psychology, economics and education). In sports education for example, resources refer to “knowledge, capacities, abilities, attitudes and instruments” (Famose, 1983), “tools” (Delignières, et al., 1995), which people can mobilize and use to accomplish a task. For Récopé (1990), they are “declarative and procedural knowledge, structural and functional capacities, abilities”. In psychology, resources encompass knowledge stored in memory and the means used to activate and coordinate such knowledge (Guillevic, 1991). In economics, resources define “goods and services” (Sen, 1999).

In this paper, resources are studied as considered, in the education field, by DISCAS¹, i.e., everything that an individual perceives as potentially useful for achievement of an activity. Thus, we consider that a resource is not necessarily what is “by nature or social consensus” acknowledged as useful for achievement of an activity. A potential resource only becomes an actual resource when people perceive it as such (i.e. a mean to act and access information). In fact, the use made of a resource is not necessarily one for which it was designed (e.g. case of extending or diverting use). We define a resource as an accessible and usable mean perceived by an individual as useful for the achievement of his/her activity. Consequently, we define a resourceful environment as an incentive environment, which provides essential conditions for people to recognize and coordinate relevant resources for the achievement of his/her activity, as well as to develop alternative resources for creating alternative capabilities.

Design challenges regarding people and resources

People with disabilities are considered, in this research, as emerging “capable individuals with capacities and powers to act”, as defined by Rabardel (2005) in his capable-individual approach. This author defines the capacity to act as “skills, instruments and all the resources developed by an individual, as potentially operative capabilities”. More precisely, he describes it

¹ DISCAS is a “private pedagogical consulting firm” in Quebec that operated in the field of education from 1987 to 2006.

as the “capacity to do something in a specific field of activity; it does not refer to a general capacity”. For Rabardel (2005), the power to act “depends on the individual’s external and internal conditions [...] at a particular moment in time” (i.e. available resources and what Sen (1999) has defined as conversion factors). The difference that he makes between the concepts of capacity to act and power to act is based on the distinction between “what the individual has the capacity to mobilize, and what is actually possible within particular situations and conditions of activity”.

In order to pave the way for developing the power to act with or without declining capacities (i.e., conserve functional capacities despite a physiological decline), it seems essential that situations encountered in accomplishing daily activities leave room for developing and mobilizing resources for that activity. In these circumstances, compensating for functional limitations is a major challenge for any society that wants to offer its population the possibility of a quality existence. While it is necessary, such a remedial and compensatory approach to functional limitations cannot alone ensure the development of the individual’s power to act. Innovations in the design for activity must also anticipate future conditions and preserve functioning for as long as possible. In this sense, we consider that there is a two-fold challenge in designing conditions for successful human development.

The two- fold challenge of design consists of slowing down deterioration in the functional state of the individual functioning and of preserving actual functioning. In the diagram below (Figure 2) the pivot is the capable individual and the two challenges are represented by two levers, which act on the growth and decay of individual development. Of course this action is limited by the individual's stage of development and current capacities. The area of lever movement is called the “Zone of Proximal Development” (ZPD), which is drawn from the concept Vygotsky (1978) developed in his studies of the child’s intellectual development. This area represents the possible development of a capable individual; it is a zone of proximal development and a potential deterioration zone. This means our ZPD is more an idea of development in deterioration or of movement rather than recovery.

Vygotsky considers two levels of development. The first corresponds to the “current development of the child”, which refers to the degree of development of the child’s mental functions and capacity for independent action. The second refers to the potential level of development of the child in interactions with others and especially with adults who increase the child’s possibilities. We posit that competencies expressed with the help of the environment can be internalized to form the outlines of the child’s development. In other words, "what a child can do today by working with others, he can do alone tomorrow." The difference between these two levels reflects the child's learning potential and forms the “closest zone of development” or “zone of proximal development (ZPD)”. However, according to Vygotsky, adult’s mediation and collaboration have their limits: it is pointless to tell the child that its present stage of development does not allow it to learn. Vygotsky considers the ZPD as a more or less stable characteristic of the child at a given moment in its development (this is an area within some things are accessible at a given moment and others less so), and that to be effective, the intervention of a mediator (e.g. an adult or a teacher) must lie within the ZPD. By analogy with Vygotsky’s approach, we consider two plans of human development, namely, growth and decay. The first level corresponds to the current development of the individual and refers to the degree of development attained and his/her capacity to act. The second level refers to the potential level of development, taking into account the characteristics of the individual, situations and places of work and daily existence.

In this logic, and in order to maintain (or develop) the individual's capacity and power to act, living environments should offer resources tailored to the individual's needs, to his/her level of development and current state of functioning. On one hand, these resources tend to preserve by stimulating and soliciting actual functions through personal development (e.g. skills, instruments). On the other hand, they compensate for and/or slow down the deterioration of personal functioning by using "mental and physical crutches" (e.g. technical, technological, human), following the principles of scaffolding (Bruner, 1983). This metaphor of crutches describes the whole set of resources that are used to support the individual's development or construction as long as needed, and which can be removed when the individual is able to support him or herself (Barth, 1993). The adaptation and adjustment of these resources to individuals and situations is one of the essential characteristics of scaffolding (Mercer, 1995).

Whatever the case, the development and deterioration of the user's capabilities are limited to the zone of proximal development (ZPD), which can be assimilated with the zone of a capable individual's recovery. In any case, proposed and implemented resources will not enable the individual to do what is ruled out by his/her stage of development and current functional state. They simply provide alternative ways of organizing "an orderly retreat"² so as to maintain the individual's capacity to act.

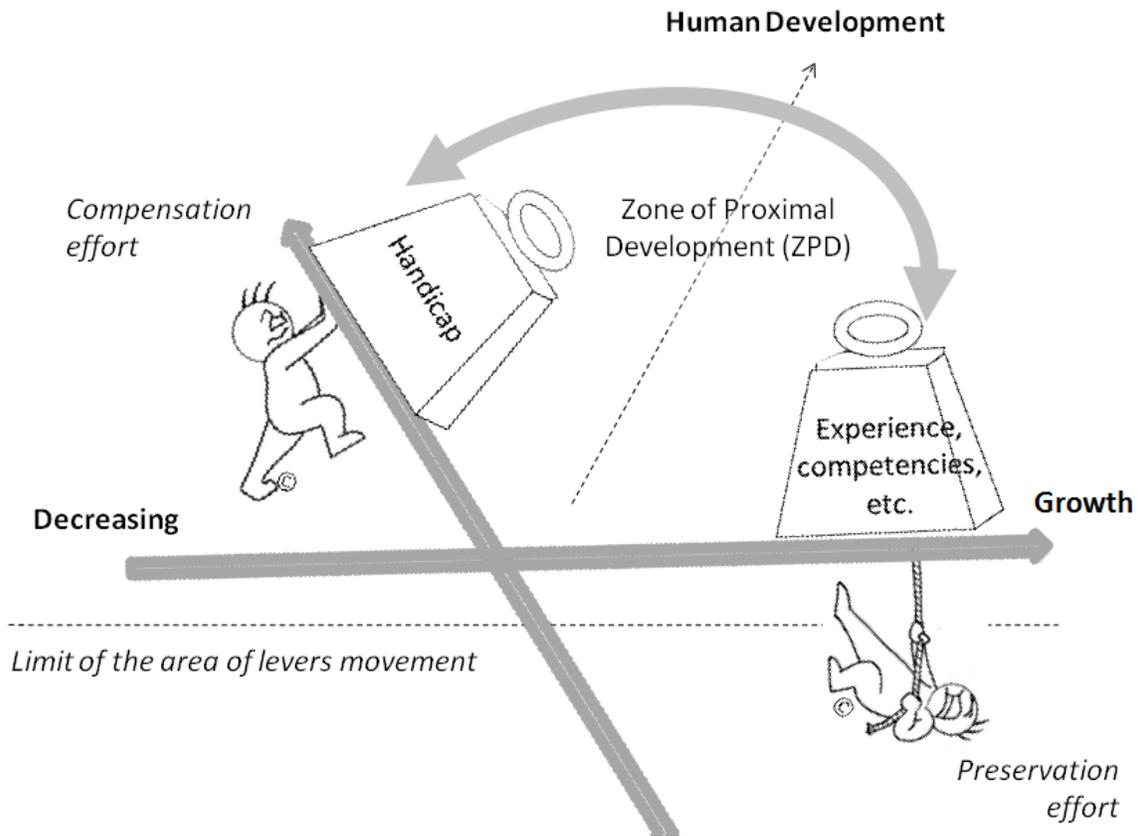


Figure 2 Zone of Proximal Development (ZPD)

² This expression was proposed by Pierre Rabardel, Professor Emeritus in psychology and ergonomics at the University Paris 8, Saint-Denis, France.

Human development Model and Capability Creation Process

Resources and capabilities

Sen (1999) defines *capability* as “all the human functionings that are feasibly able to be achieved, whether used or not” (Sen, 1999). For Pavageau, Nascimento, & Falzon (2007), it refers to individual’s effective latitude (Pavageau, et al., 2007), i.e. individual’s room to maneuver. However, we consider as noted by Falzon (2005; 2006), that “what is important are the individuals’ real capabilities providing a tangible freedom of choice in all areas of life, thus ensuring the possibility of personal development”. In fact, the choice is not always up to the individual (e.g. customary or habitual choices).

Individual flexibility and the opportunities for action refer to all the resources available for the individual in the pursuit of personal goals, no matter how they are used. Nevertheless, access to resources does not guarantee the development of capabilities or real freedoms, both of which are conditioned by appropriate conversion factors (Sen, 1999; Bonvin, 2012; Bonvin, et al. 2007) (Figure 3). Robeyns (2000) identified the three types of conversion factors, which are described by Bonvin, et al. (2007): individual factors, social factors and environmental factors. Conversion factors prevent or allow an individual to convert resources or opportunities for action into “potential for individual growth and achievement.” We define appropriate conversion factors as individual factors, social factors and environmental factors, which allow an individual to recognize and coordinate relevant resources for achieving his/her activity autonomously and securely.

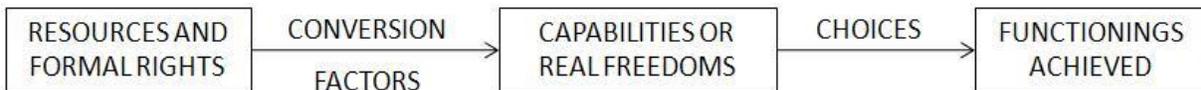


Figure 3 The Capability Approach developed by Sen (Bonvin and Farvaque, 2007)

What are the resources used by the people and why? Under what circumstances are they or are they not used? These questions help to evaluate the actual capabilities of individuals by examining the properties of resources that are pertinent for individuals and that must be taken into account when designing enabling environments or organizations. In our opinion, beyond constraints and requirements of activity, the design of new resources involves exploring user schemas³ and representations as well as analyzing their uses of resources (e.g. the functions that are appreciated or preferred). As we mentioned above, the use made of a resource is not necessarily one for which it was designed (e.g. case of extending or diverting use). The resource failure and substitution method (MDSR), developed by Rabardel, et al. (2003), is interesting here, because it enables us to link benefits (opportunities) and weaknesses (impossibilities) of various resources used by people in order to show the importance of certain resources. In a previous study (Arab, Pigot, Rabardel, Folcher, Rigaud, & Mokhtari, 2011), we have shown that people organize a measure of redundancy within their system of resources in anticipation of failure or absence. This redundancy introduces flexibility into the individual’s system of resources, enabling him/her to choose the most suitable resource for the situation. Our results also show that the nature of an individual’s system of resources relies on a functional

³ Schemas refer to organized responses that can be generalized from one situation to another.

organization of the resources mobilized. The use of one resource rather than another is based on a set of characteristics not on a single feature. This set of characteristics depends on the context, on personal characteristics and those of the situation. The use of a resource also depends on the meaning the individual gives to it, i.e. “functional and subjective values that potentially can be integrated into an activity” (Rabardel, 2005).

Resources-centered Human Development Model (R-HDM)

R-HDM fits into a developmental perspective. Derived from Fougeyrollas’ model (2010) and integrating approaches developed by Rabardel (2005) and Sen (1999), this model aims to show how living environments can provide actual opportunities for people to be more competent. Environment is seen here as a source of resources, and thus, as defined by Le Morellec, Anastassova, & Falzon (2013) as “a source of capabilities”. Nevertheless, we consider that empowerment is not only a process of social actions as defined by Barr, Cochran, Riley, & Whitham, 1984; Lee, 1994; Staub-Bernasconi, 1991 cited by Le Bossé, 1998. In fact, resources are not only provided by the environment (e.g. people, institutions, organizations), but are also intrinsic to the person. Individuals can cope alone, without resources provided by third parties.

R-HDM, described in Figure 4, makes clear that contextual factors (personal and environmental) offer (or hinder) potential resources that the individual will identify or not as actual resources for his/her activity. Barriers and facilitators, according to Sen (1999), are conversion factors which will prevent or allow him/her to convert resources to opportunities or possibilities of action (i.e. capabilities). In this case, mediated activity is then instrumented as defined in the instrumental approach (Rabardel, 1995). The person mobilizes resources for the development of his/her power to act (with an objective of active socialization) and with time and experience, these resources will in turn be mobilized in the development of his/her capacities to act (e.g. skills, instruments, knowledge). Finally, in accordance with Leplat’s work on human activity (1997), the development of the capacities and powers to act will impact respectively the personal factors (e.g. level of incapacity) and the environmental factors (e.g. complexity of the task).

In the capability approach described by Bonvin, et al. (2007) (Figure 3), resources enable the development of capabilities through appropriate conversion factors. R-HDM replaces the simple relationship between the resources and capabilities by a two-way arrow. This arrow represents a control loop: the capabilities developed by resources through appropriate conversion factors will enable the development and mobilization of new resources, which in turn enrich the individual’s system of resources. We consider that appropriate conversion factors are not limited to the so-called “positive” conversion factors (i.e., facilitators). They also include “negative” conversion factors (i.e., uncomfortable or restricting) that will nonetheless provide conditions for developing new resources, insofar as they enable the subject to remain in the capable individual’s recovery zone (i.e., what Vygotsky called the zone of proximal development). This means that, in any case, proposed and implemented resources will not enable the individual to do what is ruled out by his/her stage of development and current functional state. The uncomfortable or restricting conversion factors are disturbances that according to Piaget (1987) act as “the engine of development and learning.” In this regard, our previous work (Arab, 2012) shows that people are willing to provide mental and physical effort to maintain their independence of action. It also shows that people do not turn directly to compensatory approaches that “do things for them”, but to alternative ways that enable them to act otherwise (e.g. Arab, et al., 2011; Arab, 2012). There is also a two-way arrow between the capabilities and

activity showing that the capabilities lead to the achievement of an activity, and in turn the activity can produce new opportunities of action.

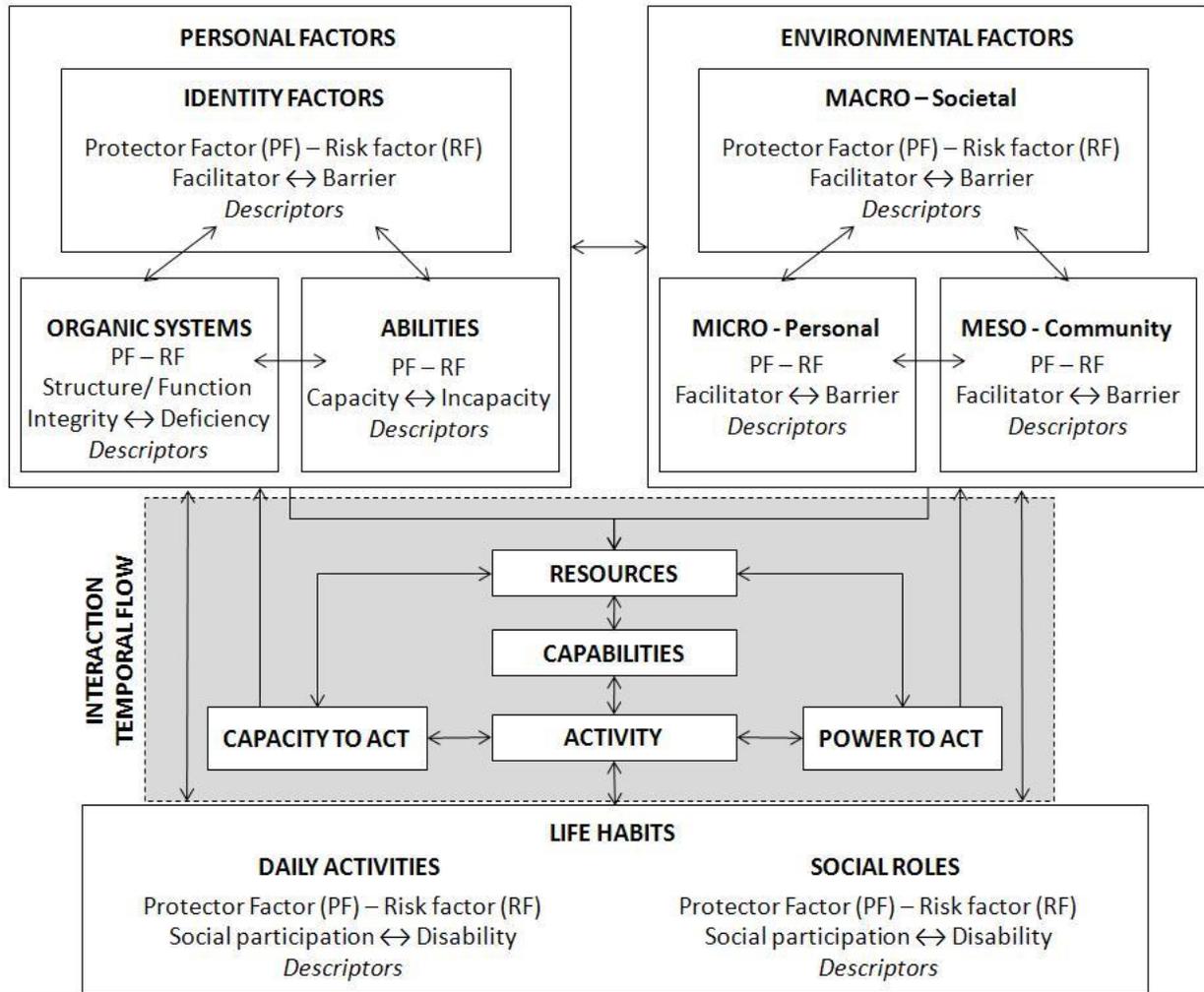


Figure 4 Resources-centered Human Development Model (R-HDM)

Discussion and Conclusion

People with disabilities are emerging capable individuals, whose individual history and personal experiences allow building reserves of alternative ways to create and produce. These alternative approaches are how we deal with the difficulties encountered in our daily existence and they are conditioned by an individual’s context and current capacities.

In this paper, we showed that the presence of useful resources does not necessarily mean they will be used. The development and use of resources rely directly on the presence of adequate conversion factors. It is only through acting on these factors that individual capacities and powers to act can be cultivated, a constraint that may limit or prevent human development. From a social and environmental perspective, this implies that resources must be functionally adaptable and adapted to the characteristics of the individual and the contextual situation. Particular attention must be paid to selection criteria fostering the use of one resource rather than another, as well as criteria of use that will help perpetuate the use of this resource, sustain its use

and promote the user's sense of ownership (Arab, et al., 2011). From an individual perspective, the action should mobilize schemas or mobilize latent reserves of capacities to act, which may be redeveloped. These resources enable the individual to develop new capacities to act and enhance the development of his/her powers to act. We define latent capacities to act as potential capacities to act (often unconscious) that people can develop when adequate conversion factors enable them to convert resources or opportunities for action. These questions are closely tied to the concept of learning or relearning new schemas, which in our view is not about the actions but about the abilities to perceive and optimize resources useful for completing an activity independently and securely. Perceiving and using relevant resources assumes that an individual knows how to explore his/her environment in order to find relevant and usable information.

Bringing about an effective enabling assistance design to be used by people with intellectual disabilities requires understanding individuals' difficulties to access information, i.e., to read, understand and learn. In this regard, our previous work (Arab, Bauchet, Pigot, Giroux, & Giroux, 2014) shows that focusing on individuals' needs is insufficient; "it is essential to find efficient ways to provide the assistance" aiming at enhancing activities that should be too complex with usual resources. Our results also show that "the enabling nature of the assistance is based on its structuring effect and its ability to simplify the organization and reorganization of the person's activity" (Arab, et al., 2014). In our opinion, future assistive means must be designed by bearing in mind the necessity to identify and add facilitators (e.g. meaningful cues) and not only to identify and eliminate factors that represent barriers (e.g. distractions leading to attention disturbances). In this field, it seems that there is a connexion to be made between research in Education and Geriatrics. In fact, research in special education can contribute to designing universally accessible living environment, especially for cognitively impaired elderly people. The deepening of these lines of thought can reduce handicapping situations and empower people to develop their capacities for adaptation.

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