

## RESEARCH

# The Disability Creation Process Model: A Comprehensive Explanation of Disabling Situations as a Guide to Developing Policy and Service Programs

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Understanding disability remains a challenge. Although the international community has largely embraced the idea that disability is the product of social and environmental practices, society still lacks good conceptual frameworks. In an era when the rights of persons with disabilities have been enshrined in international and national laws, such frameworks have become a necessity. Within the province of Quebec, Canada, the Disability Creation Process (DCP) model has served such a role. Furthermore, recent efforts to enrich the model enhance the applicability of this powerful tool to a broader range of contexts. As a result, the DCP model could be used more widely than it is today. In this paper we provide the foundations of the approach encapsulated by the model and explain how its usage guides policy development and service delivery within the province of Quebec. We also highlight its forward-looking capacities.

**Keywords:** Disability; Disability Creation Process; Convention on the Rights of People with Disabilities; Human Rights; Monitoring; Synchronic; Diachronic

## 1. Introduction

The signature and ratification of the Convention on the Rights of Persons with Disabilities (CRPD) (UN 2006) by 177 countries as of November 2018 represented a turning point for the Disability Rights Movement. It informed actors in both the public and private sectors of their responsibilities with regard to policies, services, and products that must guarantee equal access for all citizens, regardless of any functional limitations.

Based on this human rights paradigm, the CRPD may be viewed as a powerful tool to ensure fundamental rights and to facilitate full and effective participation in society of people with disabilities on an equal basis with others. At the same time, however, it poses major challenges with regard to implementation and enforcement. It is one thing to affirm that all people must have equal access to buildings, transport services, work environments, community services, information, technologies, etc., and another to redesign our social and physical environments to ensure that this occurs. Among the tools necessary for the modification, implementation and enforcement of the new rights, policies and services, a conceptual framework that situates disability within the broader context of human development is of prime importance. The construction of a theoretical model that situates disability in ways that can be harnessed by policymakers is a complex process in which many levels are interleaved.

With origins dating back to the emergence of the social model of disability, the Disability Creation Process (DCP) has been used as a conceptual springboard for efforts to develop, promote and ensure the rights of people with disabilities, and offers a robust model of disability. As a framework for contemporary research concerning disability, rehabilitation and social development, it has noticeably been used across more than 25 years to support disability policy and service development. Although widely known throughout the francophone world of disability studies and the disability rights movement, use of the DCP is less widespread in the English-speaking world. The aim of this paper is to present the development and the evolution of the DCP model, the operationalization of its components and their measurement scales, and its relation to other current disability models with a particular focus on policy and service development.

The CRPD is grounded within the social model of disability (Shakespeare and Watson 2002; Oliver 1990; Hahn 1985). The social model affirms that disability is a social product, not a medical condition. Within the original formulation of the model, an impairment may be a biological limitation, but a disability arises when society fails to provide the means to overcome such limitations in adequate ways. Focusing on the recognition and affirmation of the rights of persons with disabilities as universal human rights, the CRPD moves away from biomedical explanations that locate disability in the individual and states that disability is a social product which can be modified by acting upon environmental barriers preventing equal social participation of all citizens (UN 2006 Art 1).

Five major models have left their mark on the understanding of the phenomenon of disability as presented in the literature and as incorporated within new policy development, each with its own ontology, science, language, discourse, class of experts, and authority (Hahn, 1985; Bickenbach et al. 1999; Fougeyrollas 2010):

- The biomedical model: equates disability with impairment and understands the “disabled person” as either injured or sick, or having “problems” as well as someone who must receive treatment from health specialists;
- The economical model: addresses disability through cost-rationale measures because it understands disability as the undermining of a person’s productive and working capacities as the result of an impairment (Bickenbach 1993);
- The social model: resituates disability as a form of social oppression constructed through attitudes, representations and discriminatory practices anchored in socio-political systems valorizing performance, ableism and productivism (Oliver 1990 Shakespeare & Watson 2002; Hahn 1985; Barnes et al. 1999).
- The embodied model: reformulates disability as grounded in an ontology that rejects the separation between body and mind and views the mind as fundamentally rooted in both body and environmental realities (Shakespeare and Watson 2002; Edwards et al. 2014). New ontological approaches consider the objects, infrastructures, social and physical elements of the environment as “actants” in the disability phenomenon (Ingold, 2000).
- The human rights model: reconstructs disability as conveying fundamental and inalienable rights to ensure that people with disabilities have the same social, economic, cultural, political and civic rights as every human being (Rioux and Carbert 2003; Quinn and Degener, 2002; Fougeyrollas 2010; Griffo 2014).

## 2. Historical context of the development of the DCP model

In order to provide the broadest possible basis to a model of disability, the DCP model, also known as the Quebec Model (Badley 2008) or Handicap Creation Process (Whiteneck and Djikers 2009), and which was first formulated in the 1980s (OPHQ 1984; Fougeyrollas et al. 1991; Fougeyrollas et al. 1999; Fougeyrollas 2010), adopted an anthropological perspective, that is, it was rooted in an interactionist understanding of humans as the products of an ongoing process involving biological, physical and cultural systems. This broad foundation gave to the model a robustness that has allowed it to adapt to changing understandings of disability, and the model is currently being reformulated to address a new generation of ideas about disability. In addition, this broad framing meant that although the model has often been understood to be a variant of the social model of disability, in fact it embraces elements of earlier and current models and has the flexibility to deal with new challenges such as those posed by the monitoring of the implementation of CRPD at national, regional and municipal levels of governments.

### 2.1. The initial versions of the model

The DCP Model had a strong influence on the WHO’s process of revision of the International Classification of Impairments, Disabilities and Handicaps (WHO 1980) and specifically on the recognition by the WHO of the crucial importance of including Environmental Factors in the International Classification of Functioning, Disability and Health (ICF) (WHO 2001).

In 1978, the Quebec government passed a law to ensure the exercise of the rights of persons with disabilities. This law was accompanied by the creation of the Office des personnes handicapées du Québec (OPHQ), a public body responsible for the transversal coordination of all State departments on the issue of disability. The OPHQ developed a comprehensive policy for the social integration of people with disabilities, *On Equal Terms*, published in 1984. Led by Dr. Philip Wood, the brand new WHO classification, the *International Classification of Impairments, Disabilities and Handicaps (ICIDH)* provided a conceptual framework for the development of this policy. The framework was inspired by the pioneering work of Saad Nagi, who, in 1965, distinguished the concepts of impairment, functional limitation and disability in order to define the fields of rehabilitation and social integration as distinct from the domain of biomedical interventions (Nagi 1965). Wood’s first proposal to the WHO was, moreover, very close to Nagi’s conceptual definitions, but was met with resistance by medical professionals. This led to the experimental adoption of a version that served as a compromise between diverging views (WHO 1980). The OPHQ was particularly interested by the ICIDH because of its definition of the concept of handicap as corresponding to the social consequences and disadvantages experienced by a person having persistent sequelae of illnesses or injuries, namely organic impairments and disabilities, in the achievement of human activities. This innovative understanding of handicap led the OPHQ to realize that to act on handicap it was necessary to consider all other aspects of the responsibilities of the State towards its citizens outside of the health domain, including areas as diverse as education, employment, recreation, transportation, housing, income, etc. Furthermore, this application of the ICIDH was made in the context of the United Nations Decade of Disabled Persons (1982–1993) and the dissemination of the social model of disability at the international level. This paved the way for human rights implementation for people with impairments and disabilities. This favourable context helped to spread the work initiated by the OPHQ in 1984 and echoed the criticisms of Disabled Peoples’ International (DPI) towards the ICIDH. These criticisms denounced the biomedical anchoring of the model. In fact, the model suggested that it was because people had impairments and disabilities that they had social disadvantages. The burden of responsibility was on the person and not on society, as advocated by the social model. An essential determinant of disability was missing from the WHO’s ICIDH: the role of the environment.

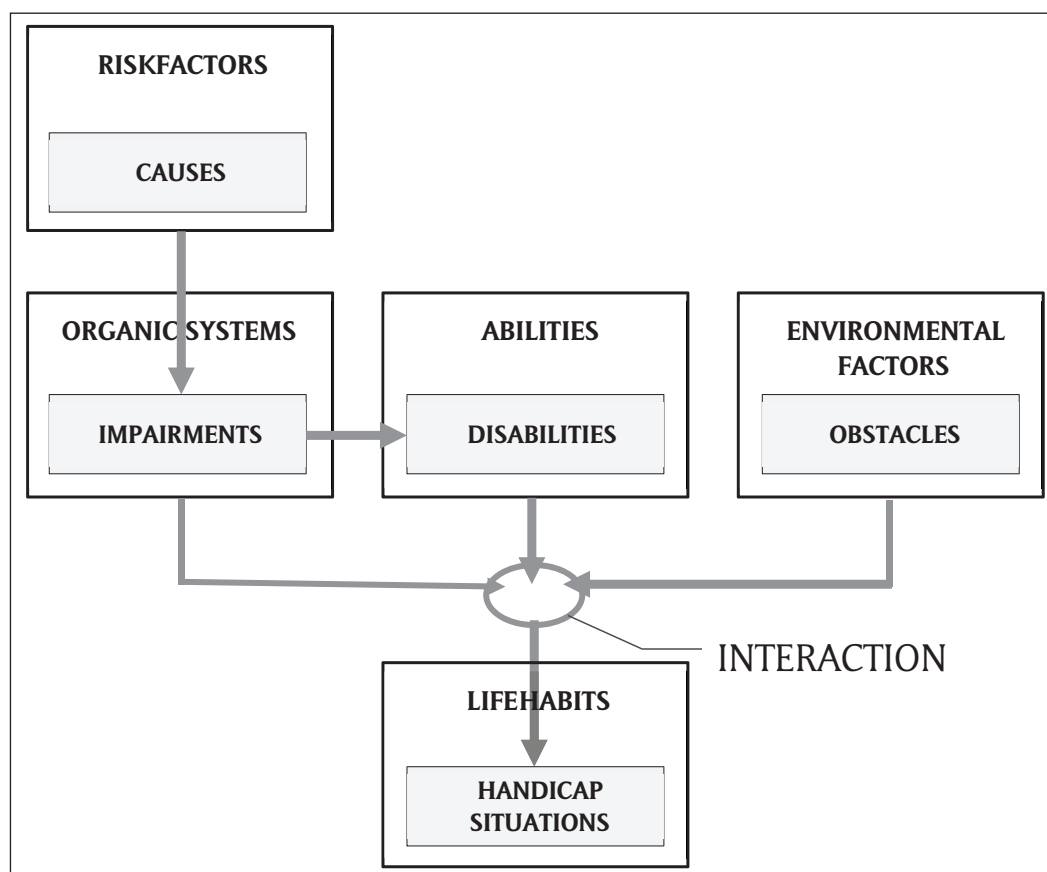
The reputation of Quebec's policy, *On Equal Terms*, enabled the OPHQ and the Quebec Committee on the ICIDH (QCICIDH), a non-profit organization founded by three Quebecers active in the disability rights movement, to promote a revision of the ICIDH and to organize an international meeting on this subject in 1987 in Quebec City. It allowed the participation of the DPI, the WHO, the UN, the Council of Europe and experts such as Philip Wood, Pierre Minaire, Claude Hamonet as well as Maryjke de Klein and Sonja Van Stokkom and representatives of the Quebec and Canadian federal governments. This meeting had two main results:

- the creation of the French, Dutch and North American WHO's collaborating centres on the ICIDH who would, during the next 15 years, coordinate with the WHO in Geneva over the revision of the ICIDH;
- the definition of a mandate entrusted to the OPHQ and the QCICIDH to propose a revision of the concept of handicap inspired by the conceptual development of the policy *On Equal Terms*.

The first version of the DCP was published in 1991 (Fougeyrollas et al.) (**Figure 1**). This conceptual framework was interactionist and systemic. Its conceptual dimensions were mutually exclusive and made clear the distinction between risk factors, organic systems, abilities, life habits and environmental factors. Formulated in a positive manner, this model situated disability within a temporal process whereby risk factors could lead to a person's illness or traumas. These could in turn lead to impairments or body system injuries and additional disabilities. However, these personal characteristics were viewed as having negative impacts on life habits (day-to-day activities and social roles) only in relation to obstacles encountered in daily-living contexts. The DCP thus conceived disability as situational and inseparable from the consideration of environmental factors, society and community.

This 1991 version was disseminated internationally through the participation of the QCICIDH in the ICIDH committees of the Council of Europe and the WHO. But it was not until 1993 that the WHO agreed to initiate the revision of the ICIDH. Despite the persistent demand for recognition of environmental factors in the conceptualization of disability, it was only in 1995 during a meeting of the Collaborating Centres in Quebec City that the WHO agreed to hear the plea of the social model of disability and the Disability Rights Movement.

Then, in 1999, the DCP model was extended to incorporate both an evolutionary perspective and a human development perspective (Fougeyrollas et al. 1999). Hence the individual is understood to be an organism developing over time from birth to death in perpetual interaction with environmental factors, enabling one to address how ability and disability changes over the course of a person's life (Priestley 2000).



**Figure 1:** Disability Creation Process (1991).  
C.S.I.C.I.D.H., 1991.

The systemic nature of the human ontogenesis model that is embedded within the DCP is important for several reasons. Firstly, the DCP avoids placing the disability within the person, but instead assigns disability to the interactive process between body and bodily function, the person with his or her characteristics on one side and the environment on the other, and this may or may not lead to disabling situations in social activities undertaken by the person. From an anthropological perspective, daily activities and social roles are socio-culturally constructed and called within the DCP model: Life Habits (see sections 4.1.3).

In 2001, the WHO published the International Classification of Functioning, Disability and Health (ICF) (WHO 2001).

Many of its elements converged with the DCP, such as the move to systemized interactive modelling, the adoption of positive concepts and of scales of measurement for each conceptual dimension, and the addition of environmental factors. However, the ICF remained, as expressed in its title, anchored in the domain of health, the conceptual segmentation (see **Table 1**) of the three main concepts (Body structures and functions, Activities and Participation being the same as those of the ICIDH (Impairments, Disabilities and Handicaps). Furthermore, the WHO renounced the mutual exclusivity of the concepts of activities and participation, in contrast to the concepts of capabilities and life habits found within the DCP. A common nomenclature was adopted for the concepts of activities and participation, which differed only in their qualifiers. Activities drew on the qualifier 'capacity', meaning the execution of tasks in a standard environment, and participation drew on the qualifier 'performance', meaning the execution of tasks in the current environment. This difficulty in distinguishing what belongs to the person from what results from the interaction between the person's capacities and environmental factors has been criticized (Badley 2008; Whiteneck and Djikers 2009; Granlund 2013). The ICF was allowing for the possibility of attributing the burden of disability to a person for her inability to take the bus or to work. This tendency was not compatible with the interactive design of the DCP. That is why the International Network on the Disability Creation Process (INDCP), the new name for the non-profit organization QCICIDH, decided to pursue the development and applications of the DCP independently of the ICF, with a view to implementing the right to equality and the development of inclusive policies, programs, services and material contexts.

## **2.2. The latest version of the DCP model**

The 2010 revision of the DCP model led to the introduction of a third subcomponent into the Personal Factors component, the Identity Factors component (Fougeyrollas 2010). This is partially in response to the new temporal framework in which identity is considered a time-changing aspect of human development, especially in the disability creation process or even the process of habilitation-rehabilitation. However, identity is also an emergent systems phenomenon, it cannot be easily located within any system or subsystem, it is singular. Furthermore, contemporary understanding of disability demands that identity be included in our models – identity issues contribute to the disabling process (Robine et al. 1998; Badley 2008). Identity is also a characteristic that mediates between individual and societal dynamics, and is today characterized by a multiplicity of dimensions, via the notion of intersectionality (Barnartt, 2013). Identity factors as covered by the revised DCP include age, sex, gender, skin colour, sociocultural identity, sexual orientation, values, beliefs, life history and so forth.

As well, a multi-scale perspective has been introduced into the understanding of Environmental Factors to provide it with a stronger foundation as a framework for setting disability service and policy guidelines. Hence the model adopts an approach based on three systemic spatial scales, called the Micro, Meso and Macro level (Bronfenbrenner 1979). These are understood to be first and foremost, a personal space of intervention (Micro), a communal space of intervention (Meso) and a societal space of intervention (Macro).

The conceptual crosswalk (see **Table 1**) allows a better understanding of components of successive versions of disability frameworks in the field of rehabilitation and social participation. Nagi's concepts incorporated the same segmentation as the DCP but this was never developed into a full classification. The ICIDH and the ICF kept a conceptual segmentation that perpetuated overlaps between body functions and activities and between activities and participation. The mutual exclusivity of what conceptually belongs to the person and what belongs to the outcomes of the interactive process between personal and environmental factors is the main distinctive feature of the DCP in comparison with the ICF. This is because the DCP classification is not anchored in the health paradigm but rather within the Human Rights perspective for social change and inclusion of diversity, commensurate with the CRPD and hence with the international legal framework that supports people with disability.

## **3. Fundamentals of the DCP**

From an anthropological perspective, the disability phenomenon cannot be conceived as a separate reality from human development. To separate these would be to perpetuate the binary perception that distinguishes so-called disabled people, characterized by 'health decrements,' from those people perceived to be 'valid' 'normal' or 'healthy.' Indeed, limitations or morphological and functional variations are part of the human condition and have characterized human development for millennia. Hence bodily impairments, functional differences, and disabling situations are an intrinsic part of human development. Furthermore, people will pass through different stages that may change from being non-disabling to disabling, or vice versa, over the course of their lives. Current research suggests that, on average, most of the population will pass through a period of about eight years of disability, mostly late in life (Disabled World 2015). Hence disability is not simply a static state, reflecting a synchronic perspective, but rather a state embedded in a

**Table 1:** Conceptual Crosswalk In The Field Of Disability (2018).

	Protection Factors/ Risk Factors	Causes	Personal Factors (Identity)	Organic Structures	Organic Internal Functions	Functional Capabilities	ADL IADL	Social Roles	Social and Physical Environment
<b>Nagi (1965–1976)</b>	o	Diseases	o	Impairments	Impairments	Functional Limitations	Disabilities	Disabilities	o
<b>WHO ICIDH Wood (1980)</b>	o	Injuries Diseases	o	Impairments	Impairments	Disabilities	Handicap	Handicap	o
<b>NCMRR USA Nagi (1993)</b>	o	Diseases	o	Impairments	Impairments	Functional Limitations	Disabilities	Disabilities	o
<b>QCICIDH (1991)</b>	Risk Factors	Causes	Personal Factors	Organic Systems (Integrity/Impairment)	Organic Systems (Integrity/Impairment)	Capabilities (Ability/Disability)	Life Habits (Social participation situation/Disabling situation)	Life Habits (Social participation situation/Disabling situation)	Environmental Factors (Facilitators/Obstacles)
<b>INDCP (1998) DCP</b>									
<b>WHO ICF (2001)</b>	o	Health Problem	Personal Factors (Contextual Factors)	Organs Structures (Structural Integrity/Impairment)	Organs Structures (Structural Integrity/Impairment)	Organic Functions (Functional Integrity/Impairment)	Activities (Capacity in standard environment)	Participation (Performance in actual environment)	Environmental Factors (Facilitators/Obstacles) (Contextual Factors)
<b>INDCP (2010) HDM-DCP</b>	Protection Factors/Risk Factors	Injuries Diseases Human development differences	Identity Factors (Facilitators/Obstacles)	Organic Systems (Integrity/Impairment)	Organic Systems (Integrity/Impairment)	Capabilities (Ability/Disability)	Life Habits (Social participation situation/Disabling situation)	Life Habits (Social participation situation/Disabling situation)	Environmental Factors Micro-Meso-Macro (Facilitators/Obstacles)

changing context, that of a diachronic perspective. This diachronic perspective was introduced more explicitly into the DCP model during its revision in 2010 (Figure 3) (Fougeyrollas 2010).

Such an orientation situates the study of people with disabilities within a broader understanding of how people function as socio-environmental beings. Disability is understood as being locally and culturally defined and as being subjected to multiple power relations through which ways of acting, thinking and being are recognized, validated or discredited. In common stance with other studies in social science, the DCP model renders explicit the implications of imposing theoretical ‘truths’ on the body, the overall development of human beings, their participation in society and the exercise of their rights. Many extant approaches to disability situate this condition synchronically, as if disability and disabling situations persisted in time over a person’s entire life. Sometimes they do, but even then, the conditions of its expression will change over time. A diachronic perspective, which allows an analysis of personal transformations through time, is therefore an approach that better supports strategies of change.

The expression ‘Disability Creation Process’ subtly emphasizes this diachronic perspective. The expression is used as synonymous with the phenomenon or process of disablement. Indeed, the DCP model makes a distinction between the field of reality which gives rise to the disability phenomenon, and the concept of a “disabling situation” which is a reduction or disturbance in the accomplishment of social activities on the part of individuals.

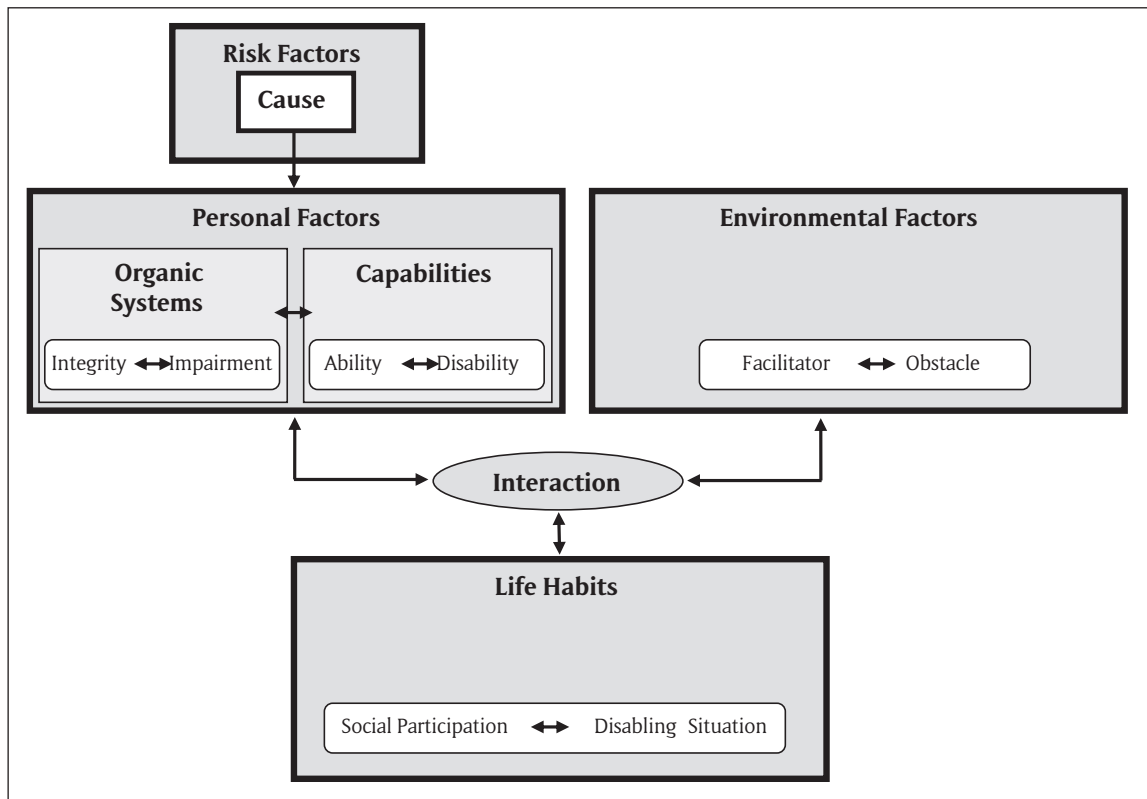
**3.1. Specific dimensions of the DCP model**

**3.1.1. Personal Factors**

In the 1998 version of the model (Figure 2), the Personal Factors component encompassed two subcomponents, Organic Systems and Capabilities. Impairment was a measurement or qualifier associated with the Organic Systems, going from full impairment to integrity, while disability, or functional limitation, was a measurement associated with Capability, going from full disability to ability. Within the DCP model, Personal Factors and the reduction of Life Habits as a result of interaction with disabling environments belong to separate, mutually exclusive conceptual domains, as one would expect from a social model perspective and a scientific classification (Whiteneck and Djikers 2009).

**3.1.2. Environmental Factors**

Environmental factors are characterized via social or physical dimensions that determine a society’s organization and context in relation to the individual. Because of this, the classification of environmental components is applicable to all people regardless of their level of disability or ability. It can also be used in different geographical or cultural contexts.



**Figure 2: Disability Creation Process Conceptual Scheme.** An explanatory model of the causes and consequences of disease, trauma and disruptions to a person’s integrity or development.

Environmental Factors may either be facilitators, that is, they support the accomplishment of Life Habits in interaction with personal factors, or obstacles that hamper such accomplishment and produce disabling situations. A facilitator for one person or situation may constitute an obstacle for another—these are context dependent.

The corresponding measurement scale ranges from optimal facilitators to complete obstacles. Note that this measurement scale only makes sense in relation to the individual's life habits (social activities) and relevant personal variables (impairments, disabilities, abilities, and identities). Hence the environment is not a separate category, but one that includes contextual information from the other categories. Access to assistive devices and technologies, the accessibility of the built environment, the availability of inclusive work or living environments, the attitudes of employers, colleagues, architects and engineers responsible for the built environment, and the attitudes of caregivers all factor into the determination of whether environmental elements are facilitators or obstacles (Imrie 2012; Boys 2014). Additional factors may include climate, professional training of service workers and the extent to which equality laws are present and enforced.

By separating off the three spatial dimensions of the environment (Micro, Meso, and Macro level), it becomes possible to modulate intervention strategies as a function of the types of engagements involved. Recently, this notion of three intervention levels has been applied as a fully articulated spatial perspective for service development and research planning (Noreau et al. 2015; Edwards et al. 2014). In Noreau et al. (2015) it was proposed that assistive devices that are mobile and that do not require legal certification to implement may be viewed as framed by the Micro intervention level (that is, they require only personal action, and hence are commensurate with microscale interventions), devices that are related to motor vehicles or must be built into homes, and hence require some level of certification, may be viewed as Meso level interventions, while assistive technologies that engage with large societal infrastructures may be understood as Macro level innovations. In this way, the notion of intervention levels is linked to the notion of spatial scale in a way that is commensurate with the original intention of this multi-level approach. In Edwards et al. (2014), the three levels were further situated regarding a more embodied perspective, again reinforcing the “spatial” interpretation of the three levels. Measurement of environmental situations, however, requires the ability to define environmental context in a standard, objective, non-reductive and reproducible manner. Examples of reductive measurements of the environment might include the intensity of luminosity or the logical relationship between two sentences in a text. Such measurements may be of interest, but they must be conducted in situ, and in relation to a person and their abilities. Such environmental factors were the object of measurement for the tool Measurement of Quality of Environment (MQE) (see below). More recently, Gamache et al. (2018) explained the physical factors taxon of the model by adding factors from the built environment using Quebec City's databases of objects and infrastructures. This work has made the identification of physical factors of the built environment during fieldwork an easier task.

### 3.1.3. Life Habits

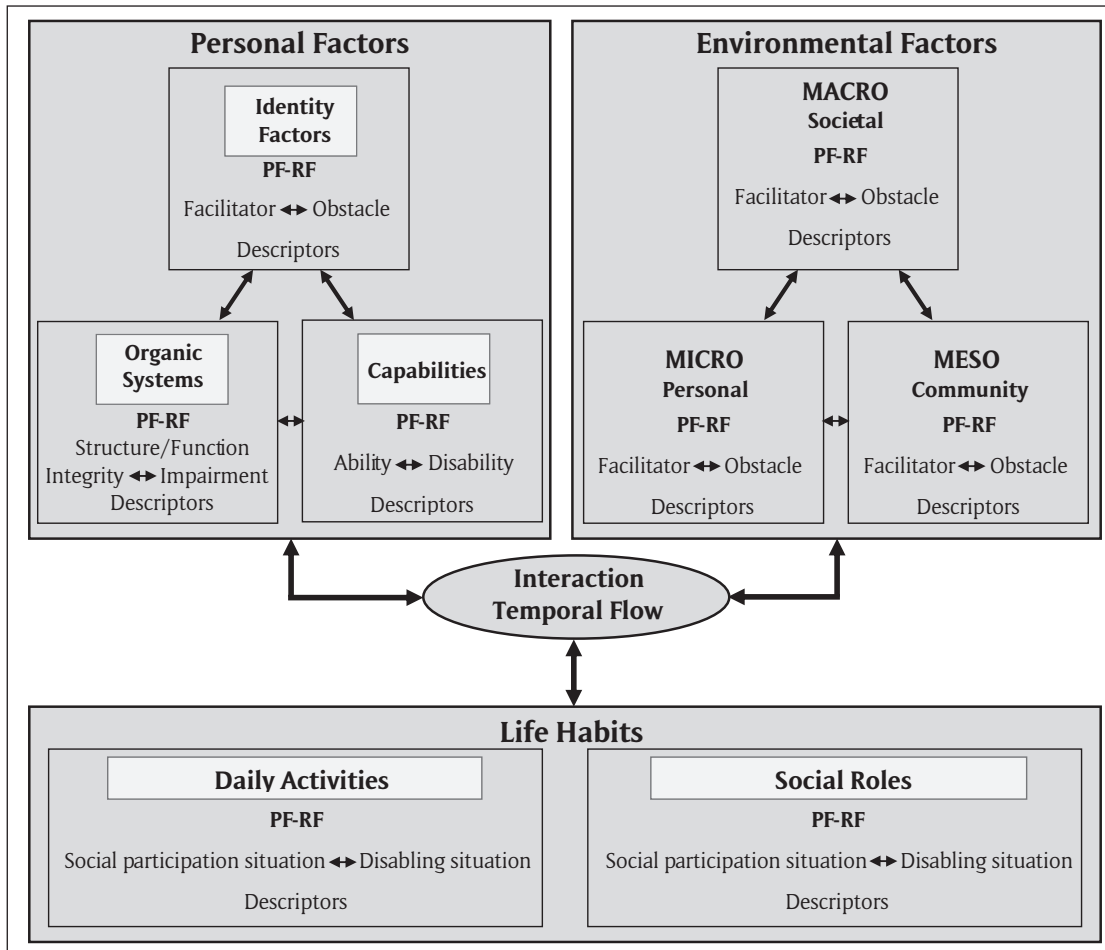
The notion of Life Habits incorporated into the DCP model is grounded in the concept of ‘habitus’ promoted by Bourdieu (1983), which views habits as the result of a habituation process arising from socialization and learning. Mauss (1973), in a study focused on what he called ‘body techniques,’ defined habitus as cultural elements anchored in the body and in the daily practices of individuals. Indeed, for both Bourdieu and Mauss, habits are neither conscious nor rational. Hence the notion of “life habits” is in continuity with the concept of habitus as developed by Mauss, Bourdieu, and others (Stiker 2000) in sociology and anthropology.

The person is modelled as a set of organic systems and capabilities (collectively grouped under Personal Factors), and as a set of Life Habits, while the Environment consists of physical and social factors. Life Habits include the social activities that humans engage in over the course of their lives, along with the social roles that people adopt (**Figure 3**). The focus on systems means that the primary mode of operationalization is to identify the factors that affect the dynamics of the system and their interplay—hence the Personal and Environmental factors and Life Habits that form the heart of the model.

This is the reason that Life Habits are associated with a distinct component of the model—disabling situations arise when life habits interact with poorly designed or stigmatizing environments and bodily impairments. In this way, the DCP model embraces both a social and an individual viewpoint. The model explicitly incorporates the process of generating disabling situations, and mediates this process as a function of a person's life habits in this specific context. This is one of the crucial characteristics that facilitates the effective use of the DCP model for structuring service delivery programs that are enabling.

Life habits are complex constructs that are inseparable from the cultural matrix of meanings and representations anchored in specific times and places (Robine et al. 1997; Fougeyrollas 1999b; Fougeyrollas 2010). They include everything that has been socially learned and determined to be significant. Note, however, that the notion of a life habit is not restricted to that of “routine activities” such as understood in the context of models of human occupation in the field of occupational therapy (Law et al. 1996; Kielhofner 2002).

As for the other primary categories within the DCP model, a measurement scale has been established to assess the quality of the accomplishment of life habits, ranging from full social participation to situations that are completely disabling (see section 4 on measurement below).



**Figure 3:** Human Development Model and Disability Creation Process (HDM-DCP).

**Legend:** PF-RF: Protective Factor – Risk Factor.

Unlike their treatment in older models (e.g. the biomedical model) or the ICF, life habits as day-to-day activities are not considered to be intrinsic characteristics of a person. Furthermore, the separation between a person's capabilities (abilities grading into disabilities), their performance in activities, and their outcomes (ranging from full social participation to fully disabling situations) is essential in developing appropriate services—it both marks and avoids the confusion between disabilities and disabling situations (Fougeyrollas, 1995; Fougeyrollas et al. 1998; Badley, 2008; Fougeyrollas 2010; Whiteneck and Djikers 2009). Different measurements are necessary for these two domains. For example, assistive devices may render a person more capable, but that does not necessarily result in better social outcomes if significant environmental obstacles remain. This difference is of critical importance in the exercise of ensuring that the human rights of people with disabilities are fulfilled. The rights enshrined in law guarantee full social participation, not improved ability.

#### 3.1.4. Risk and Protection Factors

Another unique aspect of the DCP model is the explicit inclusion of a component originally labelled Risk Factors, and recently extended to include Factors of Protection. The extension was motivated by a broad range of considerations, including the need to fine tune the model in its application to intellectual or cognitive disabilities or mental health issues, and to accommodate the changing physical realities of the body over time, as well as the identification of social contexts that may engender risk or offer protection. In addition, this component of the model favours a stronger relationship between research and intervention, and between theory and practice. Indeed, research efforts may focus on identifying risk factors that potentially influence the development of the person, and intervention practices may then focus on implementing measures of protection to limit the impacts of these risk factors. Hence these factors may be personal or environmental, social or functional, or related to the accomplishment of life habits.

#### 4. Measurement of the Different Components of the DCP Model

As mentioned earlier, several measurement instruments have been developed using the DCP model as a conceptual framework. The Assessment of Life Habits (LIFE-H) and the Measure of the Quality of the Environment (MQE) instruments are the two most important tools that have been developed and extensively validated as robust measurement



instruments. Originally developed in a francophone context, both instruments have been translated and adapted to function in anglophone environments and are now available in more than ten different languages.

The LIFE-H (Assessment of Life Habits) has been studied and evaluated in a variety of contexts (Figueiredo et al. 2010; Noreau et al. 2007; Noreau et al. 2004). The MQE (Measurement of Quality of Environment) has likewise been studied and used in many different ways (Stark et al. 2007; Jadwisieniczak 2008; Levasseur et al. 2008; Tate, 2010; Reinhardt et al. 2011; Alvarelhao et al. 2012; Boucher et al. 2010). Both instruments perform equally as well as others in their respective categories. Both have the additional advantage, however, of responding directly to the principles incorporated within the DCP model.

The LIFE-H instrument was developed to measure the quality of social participation of people with disabilities by estimating how a person accomplishes their daily life activities and fulfills their social roles (Fougeyrollas et al. 1998a) within his or her environment (home, workplace, school, neighborhood, etc.). Furthermore, the quality of a person's environment may be assessed using another tool (MQE) which measures the degree to which environmental elements facilitate or inhibit the accomplishment of social activities (Fougeyrollas et al. 1999; Reinhardt et al. 2011).

## 5. Application to Policy and Service Development—The Quebec Context

As mentioned earlier, the DCP model (Badley 2008; Whiteneck and Djikers 2009) has been widely used to guide policy development and service delivery within the province of Quebec, Canada, as well as serving as a useful framework for structuring and aligning research with clinical practice (Fougeyrollas 2010). It has supported the development of rehabilitation programs for people with both physical and intellectual disabilities since the mid-1990s (MSSS 1995, 2017). These experiences demonstrate that the distinction between personal factors and environmental factors and their ongoing interactions via life habits as determinants of social participation has been particularly useful for policymakers and program designers. The model helped them determine clearly and unequivocally which factors fell within their mandate and which did not. In addition, within clinical environments, clinicians were able to hone their intervention in terms of life habits, offering meaningful services of critical importance to clients and their families. From this perspective, it is also possible to address the issue of access to services or financial compensation based on the DCP model. In terms of public policies, programs and services, diagnosis is generally the most important criteria for access. The innovative nature of the program put in place by the Government of Quebec for families granting them a supplement for disabled children with exceptional care needs based on the DCP model (Retraite Québec 2016) must be emphasized. Thus, it is no longer the diagnosis that determines access to services, programs or funding, but the level of disruption of life habits that requires complex care at home or whose limitations disrupt the achievement of the life habits of the child. In this case, the focus of the compensation assessment process is on the need of the family and also the age of the child. Furthermore, since 2009, the DCP model has been adopted by the Quebec government for the implementation of the government policy “Equal in Every Respect: Because Rights are Meant to be Exercised” (OPHQ 2009), which is fully coherent with the CRPD. The OPHQ which is the governmental organism responsible for reviewing annual statutory reports and the action plans produced by municipalities and other governmental agencies to address the implementation of the law, incorporates the DCP model within its evaluation strategy. The monitoring process, which oversees the reduction of environmental barriers to ensure social participation by multiple stakeholders using indicators derived from the DCP model, is to our knowledge, an original and innovative contribution to such policy assessment (Fougeyrollas and Grenier 2018). More concretely and according to their areas of responsibility, municipalities first drew up a portrait of the situation allowing the identification of local obstacles experienced in the day-to-day activities of citizens with disabilities (OPHQ 2011). Subsequently, they developed an action plan based on the DCP model allowing them to define the target population, i.e. people with different types of disabilities, and identify the environmental factors that constituted barriers to their social participation, especially in connection with leisure activities. Thus, for example, the renovation of a community recreation centre led to its full accessibility within its physical dimensions thus facilitating its usability by citizens with disabilities. In this case, attendance and ease of use were indicators of improvement in the carrying out of leisure activities.

The same is true for the Quebec Ministry of Transport, which recommends that public transport corporations elaborate accessibility plans based on the DCP model (Ministère des transports 2010). In a similar approach, responsible transportation authorities must identify barriers to the use of community infrastructures and regarding travel for users with disabilities. Thus, it is possible to identify such obstacles, whether these are physical or social, taking into account the types of disabilities of the users by segmenting trips or commutes in sequences formed by a travel chain beginning with the search for information (timetables, connections, etc.), through the purchase of the ticket and right through to the collection of feedback concerning the experience (Ministère des transports 2010). Finally, it is also possible to use information on the number of commutes taken and their ease of use as indicators of improved travel for users with disabilities. This approach to assessing implementation of the CRPD could potentially be adapted for other countries and contexts—indeed, a framework to assist such a process has also been developed (Fougeyrollas 2008) – and it could be useful at different levels of intervention – international, national, regional and municipal.

## 6. DCP Assessment Methodology, a way to see change

In a perspective of assessment, the DCP model allows to assess the efficiency of some policies on a concrete basis, such as home care policy, with regard to the level of social participation of the service users. From a collective perspective, this task requires users to establish a functional profile in terms of capabilities for the population sample of persons with disabilities using support services; this sample should be representative of all population using this kind of services; this exercise can be based on official data obtained from the personal health record of service users. The next step consists of establishing the profile of social participation of the same sample using the Life-H. This phase allows to users to assess the needs and required levels of assistance by the person to accomplish their daily activities and exercise their social roles. This personal support should be described and quantified in terms of assistance (supervision or physical assistant), frequency, duration, stability, etc. The third step consists of using the MQE to assess the perceived influence of the environmental factors by the persons in accomplishing their daily activities and exercising their social roles. Amongst these factors, we would find support services. This profile should be put in relation with the environmental context in which support services are delivered. The fourth step would then be to identify the different manners that services are offered to persons with disabilities. The analysis of services moves the attention to the environment of the persons; this requires a description of organizations, their roles, their programs and activities in order to identify the ways services work including who delivers the services (public agency, community groups, private corporation, etc.), types of services that are available, delivery modalities and their cost. Finally, the DCP model can be used to assess a policy and its related programs, support services for example, through time which allows to establish a good portrait of the effects of interventions on the social participation of persons with disabilities.

Finally, since the year 2000, the DCP model has been adopted by Handicap International. The model provides a culturally sensitive framework for its community-based rehabilitation and inclusive local development programs in over sixty developing countries. This is an indication of its applicability to a broad international environment (Boucher et al. 2015). Furthermore, the framework is supported by an international NGO (the International Network on the Disability Creation Process) that handles queries and offers support for its use, as well as steering ongoing research towards its further development and use.

## 7. Discussion and Conclusion

The key elements that make the DCP model of interest for policy and service development, as well as the exercise of human rights, include:

- The separation between independent variables such as personal and environmental factors as well as dependent variables such as life habits which encapsulate a person's experience of social participation and disabling situations;
- The existence of a measurement scale for each major category, several of which are associated with well-defined measurement instruments;
- The incorporation of a diachronic perspective, which assumes and asserts that people's life situations change over time and allows evaluation of the impact of interventions or programs by measuring changes between periodic synchronic snapshots of the components of the model;
- An explicit focus on risk factors that may affect or complicate the development of a person and their impairments over time, and on the factors of protection that may be introduced to assist people living with disabilities to address these risk factors;
- The incorporation of a multi-level perspective in the environmental dimension, which situates interventions at different spatial and intervention levels;
- The possibility to assess disability and human development, not just at the personal level but also at the population level such as by countries and their inhabitants, cities, neighborhoods, etc. and
- An overall focus that combines a systemic understanding with individual specifics, providing a robust framework that is adaptable to new understandings as they emerge.

The DCP model development shares a common history with the development of WHO's ICIDH and ICF classifications. **Table 1** illustrated the possibilities of further harmonization on the ground of a Human Rights' model and of monitoring the implementation of the CRPD. The International Network on DCP is collaborating with WHO'S collaborating Centers on Health Family Classifications for common improvements in the future.

Current work on the DCP model is focused on continued efforts to render it more precise and explicit in its operationalization for policy and service development and monitoring, ongoing efforts to align the model within a more ontological perspective, taking account of the embodied aspect of disability, and an interest in adapting and using the model in other human development contexts, even beyond the framework of disability. Indeed, it has been noted that the DCP model provides a very general framework for understanding and situating human activities in the context of sustainability (UN 2016), and as such may offer considerably broader functionalities than the models developed to date. Within a context where the rights of people with disabilities have been clearly recognized at the global and national levels and enshrined in state laws, the need for robust models and theoretical frameworks has never been greater, and the DCP model offers such a response.

## Competing Interests

The authors have no competing interests to declare.

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