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Aline Nardo

The Evolutionary Foundations of John Dewey's Concept of Growth and its Meaning for his Educational Theory

Abstract: John Dewey's significant contribution to the development of an anti-deterministic, non-dualistic adoption of evolutionary theory in his educational theory has been largely neglected. This paper makes explicit how Dewey's concept of growth – a concept that forms the basis of his notion of education – in particular has been informed by Darwinian evolutionary theory, specifically, by the concept of natural selection. In this way, the paper aims to enhance our understanding of Dewey's educational theory in general and at the same time offer a new perspective on current learning environments following an economic, output oriented logic, and genuinely educative experiences in the sense of Dewey.

Keywords: Dewey, Darwinism, Growth, Natural Selection, Neoliberalism

1. Introduction[1]

While in many European educational contexts John Dewey is a popular figure associated with slogans such as 'learning by doing' or the project method, his crucial contribution to the development of educational philosophy post-Darwin is often neglected (Rogers, 2012, p. 6; Popp, 2007, p. 1). In this paper, I will build on recent scholarly work on the influence of Darwinism on Dewey's concept of *growth*. Popp (2007), Huachu (2013), Perricone (2006), Saito (2005), Fesmire (2015), and Garrison, Neubert and Reich (2012) have demonstrated how the considerable neglect of the impact of the theory of evolution on Dewey's educational writings has not only led to the partial misunderstanding of his thinking, but also in particular fostered the misconception of his concept of growth. This neglect is significant because growth forms an epistemological focal point of Dewey's educational theory (see Stitzlein, 2017; Popp, 2007; Huachu, 2013). I will argue beyond this, that Dewey's concept of growth is not only influenced by Darwinism, but rather that Dewey's understanding of Darwin's concept of natural selection forms a core foundation of growth, which makes his growth-based educational theory essentially evolutionary. This evolutionary, growth-centred reading of Dewey has important implications for how we understand and apply both Dewey's psychological works and sociological reflections to current educational problems.

1 I want to thank Dr Andrea English and Prof. John Ravenscroft for their constructive feedback on this paper. I also thank the anonymous reviewers for their detailed scrutiny of my paper and their most helpful remarks.

After setting the stage for this analysis by offering an overview of the historical and intellectual context of Dewey's evolutionism, I explore Dewey's understanding of intellectual and societal growth, especially with respect to the Darwinist foundations of these notions. I aim to show how Dewey constructed his Darwinist philosophy and educational theory in direct opposition to the evolutionism of Herbert Spencer, and how this opposition affected Dewey's interpretation of Darwinism. Building on this, I will draw out the implications of a Darwinist reading of the concept of growth, and associated concepts, for educational theory and practice.

2. Historical Context – Darwinism in 20th century America

When Darwin completed the evolutionist movement of the 18th/19th century by introducing the concept of natural selection, he caused an intellectual revolution that reached far beyond its original field of geosciences and biology (Ayala, 2016, p. 3). Philosophically, Darwinism offered opposition to idealistic philosophy, informing a shift from essentialism to a dynamic perception of phenomena of all sorts (Wuketits, 2005, p. 57).

Before Dewey became a leading American scholar with his naturalistic social philosophy, Herbert Spencer practically held a "monopoly on evolution" (Hofstadter, 1958, p. 125). American society "saw its own image in the tooth-and-claw version of natural selection" (Hofstadter, 1958, p. 201); the Spencerian interpretation of the theory of evolution as a "reassuring theory of progress based upon biology and physics" was precisely what society needed (Hofstadter, 1958, p. 31). Spencer managed to turn the idealisation of competitiveness as a driving force of societal enhancement into a pseudo-natural order, justifying laissez-faire social politics: "The state of transition will of course be an unhappy state. […] The process must be undergone and the suffering must be endured" (Spencer, 1850/1902, p. 148). Spencer fostered a general hopefulness that the struggle would ultimately lead to progress (Hofstadter, 1985, p. 85; Eagle Russett, 1976, p. 86; Rogers, 2012, p. 27).

During the transition to the 20th century, Pragmatism presented a radically different evolutionary social theory that superseded Spencer's evolutionist monopoly (Kaminsky, 1992, S. 186). While Spencer's conservative interpretation of Darwinism had operated as a highly useful social theory during the post-Civil War period, it lost its explanatory potential two centuries later, in the context of a more optimistic spirit in society (Maul, 2013, p. 578). "Spencerianism had been the philosophy of inevitability; Pragmatism became the philosophy of possibility" (Hofstadter, 1958, p. 123). But it was not only the new *Zeitgeist* that created doubt about Spencer, rather it was also that fact that Spencer was one of the key figures in the uprising of individual and economic Social Darwinism, which fed into the eugenic movements in Europe and the United States. The pragmatist alternative widely avoided these problematic issues (Bowler, 2008, p. 118). Pragmatism put the emphasis on freedom and agency and therefore constructed an evolutionary social theory that stood in radical opposition to Spencer's approach (Zebrowski, 1992, p. 317).

3. Philosophical Context – The starting point of Dewey's evolutionism

The theory of evolution was highly relevant for Dewey's intellectual development and shaped his thinking from his earliest writings onwards (Popp, 2007, p. 3; Dalton, 2002, p. 38; Pring, 2007, p. 13; Maul, 2013, p. 578; Metz, 1961, p. 145). However, in contrast to other contemporary pragmatists – such as William James – Dewey did not perceive naturalism as an instrument to approach certain philosophical questions (Dalton, 2002, p. 9; Boyles, 2012, p. 144). Dewey was an "ultranaturalist" (Popp, 2007, p. 12), meaning that he was convinced that Darwinism was not merely of partial relevance to philosophy but was critical at the deepest level of philosophical concepts and arguments (Fesmire, 2015, p. 86; Dalton, 2002, p. 63). His naturalism is rooted in the philosophical issues that emerged post-Darwin; these issues urged him to rethink epistemology, ethics, as well as political and educational philosophy (Huachu, 2013, p. 84). As Fesmire writes: "If Hume aspired in the eighteenth century to be the Newton of the mind, Dewey aspired in the twentieth century to be its Darwin" (Fesmire, 2015, p. 18).

Dewey's concept of growth played a significant part within his aspiration to develop a theory that explains the complex relationship between mind and society in a way compatible with post-Darwinist philosophy. Before I discuss how growth fed into the development of Dewey's 'ultranaturalism' in the next section, I will broadly sketch out the two main areas of criticism, which Dewey sought to address. First, I consider the contradictions and inconsistencies he detected in traditional naturalism, and, second, I address his critique of teleological approaches to Darwinism.

3.1 Dewey on Traditional Naturalism

Traditional naturalism in America was built on a Cartesian dualist notion that separated body and mind into separate entities. In addition to this dualism, traditional naturalism embraced what Dewey called "mechanistic metaphysics" (Dewey, 1925/2008, p. 210), i. e. the presumption of a causal relationship between the two entities body and mind, assigning the superior role of 'cause' to the physical and the inferior part of 'effect' to the psychical. In this view, the influence of the mind on physical action – i. e. purposive, not instinct-driven conduct – is reduced to a materialist function. It seemed evident to Dewey that this philosophy is trapped in an argumentative circle contradicting its own core: the assumption of the *primacy of material*. If the cognitive influence on physical action is affiliated with a material function, matter and material become the "hiding places" (Dewey, 1886/2008, p. 102) for the psychological, which is defined as an accumulation of primitive psychological features that are thought to guide the material function (Dewey, 1887/2008, p. 38–43). In doing so, the assumed directed causality between body and soul is depleted and ultimately reversed: "He [the materialist, A. N.] is giving up all that characterizes matter as matter, and is, in effect, recognizing the *primacy of spirit*" (Dewey, 1886/2008, p. 102, emphasis mine; see also Dalton, 2002, p. 39; Fesmire, 2015, p. 47).

3.2 Dewey on Teleological Darwinism

An alternative to the views of traditional American naturalists provided the early evolutionists, who located purposiveness external to the organism (Dewey 1886/2008, p. 103). On this view, the environment works as a stimulus to the organism, whose actions form "through a long series of accidental experiments (experiments which were not experiments, as they were not trying to reach any end) of which some happened to be advantageous to the organism" (Dewey 1886/2008, 103) and *not* via insight and rationality (see Dalton, 2002, p. 279). In this, "nature is made teleological all the way through" (Dewey 1886/2008, p. 104) and evolution becomes a steady upwards movement towards a predetermined final stage of development (Egan, 2002, p. 38, p. 85; Metz, 1961, p. 10). Dewey strongly opposed such spiritual, progressivist evolutionism. In reference to Ernst Haeckel[2] and Haeckel's followers, Dewey argues: "Emergence and growth are not enough for them. They want something more than growth accompanied by toil and pain. *They want final achievement*" (Dewey, 1934/2008, p. 39, emphasis mine). In contrast to that, Dewey advocated the acknowledgment of individual agency; he rejected those "ideals of a Utopian millennium" (Dewey, 1904/2008, p. 57), which presuppose the existence of one pre-determined end.

4. Growth and Dewey's 'Ultranaturalism'

In his early years as a scholar, Dewey studied Hegel intensively, which had a considerable impact on his response to the contradictions of traditional materialism. The significance of Hegel for Dewey's thinking is a point of controversy, in particular regarding the compatibility of idealistic Hegelian elements in Dewey's thinking with a Darwinian framework (Bellmann, 2007, p. 16; Saito, 2005, p. 21; Biesta, 2016, p. 162; see also Garrison et al., 2012). While Dalton (2002) emphasizes the Hegelian influence on Dewey, others – such as Garrison (2003) – place more significance on the influence of James. Important here, however, is how Dewey, in contrast to other contemporary Hegelians did not try to 'apply' Hegelian ideas and terminology to the philosophical challenges emerging after Darwin, but rather sought inversely to "translat[e] Hegelian insights into the naturalistic terminology that was coming into vogue because of the influence of Darwinian biology and experimental psychology" (Good, 2008, p. 578; see also Rorty, 1979, p. 5). Dewey strived for the inclusion of issues such as mind or spirit into a naturalist explanatory scheme – issues which were previously excluded from the naturalist discussion. Thereby, Dewey expanded the epistemological claims of traditional naturalistic accounts.

2 Ernst Haeckel was the founder of monism, one of the most influential spiritually oriented theories among the progressivist evolutionary theories in the early 20th century Germany (see Bernstorff, 2012; Nardo, 2015).

In Dewey's view, Hegelianism lacked a scientific base (Bellmann, 2007, p. 49). In building such a base there was no getting past Darwin. At the same time, although Dewey was intrigued by the attempt of his contemporaries' attempts at evolutionary reasoning in philosophy and the social sciences, he rejected their reference to either traditional materialism or spiritualism. He was convinced that an alternative, strictly non-teleological, anti-Cartesian way of using the theory of evolution would allow him to offer a scientific theory of mind based on the idea of the emergence of consciousness, as sketched out by Hegel (Dalton, 2002, p. 279; Collins, 1960, p. 3). This is where his concept of growth starts to play a major part. The central pillars of Dewey's answer to "the challenge of Darwinian biology" (Good, 2008, p. 578) for philosophy are captured in his concept of growth. In this section, I explore these pillars of growth, and discuss the role they play in Dewey's suggestion of an 'ultranaturalist' evolutionary philosophy and educational theory.

4.1 Intellectual Growth

At the core of Dewey's naturalism is his rejection of any dualistic notion of primacy in conduct – be it the primacy of mind or that of the body (Bernstein, 1959, p. 347). In one of his earliest writings, he points out: "The psychical is immanent in the physical; immanent as directing it toward an end, and for the sake of this end selecting some activities, inhibiting others, responding to some, controlling others, and adjusting and co-ordinating the complex whole, so as, in the simplest and least wasteful way, to reach the chosen end" (Dewey, 1886/2008, p. 101). Dewey was convinced that how we act is not due to a stimulus-response mechanism, but rather it involves *purposeful* conduct. This conduct is guided by thinking, a "coherent plan of activity" (Dewey, 1938/2008, p. 42). As Dewey writes, "thinking enables us to direct our activities with foresight and to plan according to ends-in-view, or purposes of which we are aware" (Dewey, 1933/2008, p. 126).

On Dewey's account to *learn from experience* is "to make a backward and forward connection between what we do to things and what we enjoy or suffer from things in consequence" (Dewey, 1916/2008, p. 147). Through this, "every experience enacted and undergone modifies the one who acts and undergoes, while this modification affects, whether we wish or not, the quality of subsequent experiences" (Dewey, 1938/2008, p. 18). In this process of growth the individual becomes increasingly able to draw from past experiences to assign meaning to the present in a way that enhances its capability to deal with future experiences is what Dewey calls the "dawning of intelligence" (Dewey, 1899/2008, p. 184). Present experiences are integrated in the narrative of the existing experience, following the individual's "constant tendency towards unification of ideas, which allow the mind to take in larger and larger wholes in the same act, and thus economize mental power" (Dewey, 1887/2008, p. 128), adding up to a continuous picture of action and reflection (Rogers, 2012, p. 65; Popp, 2007, p. 79). In that, intelligent experiences leading to growth are not merely contemplative observations of

what is happening to oneself or reactive responses, but rather involve both an active part – of doing or trying something – and a passive part – undergoing the consequences of the action: "We do something to the thing and then it does something to us in return" (Dewey, 1916/2008, p. 146).

Experiences of discontinuity – that is, the unexpected moments which thwart our plans and which are essential for Dewey in sparking reflective thinking – need to be reworked by means of reflective thinking if they are to fit into the continuity of experience and in turn contribute to further experiences (English, 2013, p. 69). This makes the identification of discontinuity and need for further adaptation a primary condition for the individual's growth. This has profound implications for educational processes as they have to allow for negative, pre-reflexive perplexities and enable the individual to render them into problems, which requires "careful observation of the given conditions" (Dewey, 1916/2008, p. 109; see Benner & English, 2004; English, 2013). Once a pre-reflective perplexity is made into a post-reflective problem – that is, it is examined and included into the determination of the aim to be achieved (English, 2005, p. 29; see also English, 2013) – the individual can use the foresight developed during past experiences and re-establish continuity in experience.

4.2 Growth in Society and Growth of Society

The starting point of Dewey's theory of mind is his specific view of the relationship between organism and environment. He argued: "No one seriously questions that, with an adult, power and control are obtained through realization of personal ends and problems through personal selection of means and materials" (Dewey, 1899/2008, p. 135). Dewey also stressed that this intelligent and reflective selection guiding the conduct of the organism, which he referred to as growth, is not some exclusively internal function, but rather is highly influenced by the 'feedback' the organism gets from its social environment (Dewey, 1916/2008, p. 15–23; Dewey, 1932/2008, p. 309–310; see also Popp, 2007, p. 39; McDermott, 1981, p. 494): "Others approve, disapprove, protest, encourage, share and resist. Even letting a man alone is a definite response. Envy, admiration and imitation are complicities. Neutrality is non-existent. Conduct is always shared; this is the difference between it and a physiological process" (Dewey, 1922/2008, p. 17). Whilst growing, the organism develops conscience – that is, the "recognition of ends and relations to action" (Dewey, 1891/2008, p. 355) – as it relates to the social context. The individual forms habits of judgement and coping, which guide his or her conscience "through language, literature, association and legal custom" (Dewey, 1891/2008, p. 355). Thus, in Dewey's view, intellectual growth is essentially social (Dewey, 1916/2008, p. 16). I will now turn to discuss the connection to Dewey's moral philosophy that emerges from this positioning of growth and sociality.

Dewey offered an alternative to the deterministic idea of an 'intelligent environment' as a purposeful force. Instead of triggering objectively correct behaviour – as in traditional materialism – or 'rewarding' certain conduct *per se* – as assumed by teleo-

logical Darwinism, on Dewey's view the environment demands for a situational, intelligent examination of what is encountered (Dewey, 1891/2008, p. 388; Dewey 1916/2008, p. 53). In that, conduct is situational, respectively functional and therefore temporary:

> The bare repetition of identically the same acts does not consist with morality. The aim at securing a satisfaction precisely like the one already experienced is to fail to recognize the altered capacity and environment, and the altered duty. (Dewey, 1891/2008, p. 372)

However, this does not entail a mere 'anything-goes' relativism. For Dewey, ethics in the form of situational and ongoing societal development are not based on trial and error, but rather structured by the capacities of foresight and conscientiousness that each individual acquires in a shared environment. "Being held accountable by others is […] an important safeguard and directive force of growth" (Dewey, 1932/2008, p. 306), and enables the formation of common meanings and collective foresight in society.

5. Growth and Natural Selection

While Dewey maintained that the functionality of conduct remains at the centre of a person's activity, he did not conceptualise the environment as the main entity of agency, naturally selecting the most fitting behaviour. Instead, in a process of "constant growth, adjustment to new relations, intellectual and moral" (Dewey, 1886/2008, S. 112), the organism forms its actions through reflective conscious selection. Godfrey-Smith (1996) describes Dewey as a "selective externalist" (Godfrey-Smith, 1996, p. 115), conceptualising behaviour and thought in terms of adaptation to a changing environment, while at the same time integrating a notion of an intelligent actor-environment relationship. The link between growth of mind and growth of society is especially crucial for Dewey's dynamic, anti-essentialist externalism, and one of the key points of opposition to Spencer's evolutionism, where "stimulus and response are mechanically linked together in an unbroken chain" (Dewey, 1922/2008, p. 122).

Spencer combined hedonism with utilitarianism; he was convinced that there is a "correspondence of an inner with an outer order" (Dewey, 1925/2008, p. 216) – i. e. that our hedonistic strivings are aligned with what evolution 'wants' in order to progress. In the long run "duty and desire [would] grow into harmony" (Dewey, 1891/2008, p. 382), ultimately benefitting the whole species. Spencer built his theory on the assumption that "surely must the human faculties be moulded into complete fitness for the social state; so surely must evil and immorality disappear; so surely must man become perfect" (Spencer, 1893, p. 31). In contrast, on Dewey's anti-teleological evolutionary view, success and 'good' behaviour are not fixed categories, but rather highly volatile and inconclusive: "The better is the good; the best is not better than the good but is simply the discovered good" (Dewey, 1922/2008, p. 193). This "very moderate"

(Godfrey-Smith, 1996, p. 60) experimental externalism, including the idea of unceasing, undirected growth, connected with the individual's ability for conscious selection, therefore, seems to stand in stark, if not insurmountable opposition to a Spencerian "extreme externalis[m]" (Godfrey-Smith, 1996, p. 45).

However, as Godfrey-Smith (1996, p. 101) points out, it was necessary for Dewey's non-dualistic epistemology and anti-idealistic philosophy to not fall back into an internalist position either. This raises the question of how stark this opposition between Dewey's and Spencer's evolutionary concepts actually is. In particular, it poses the issue of how Dewey dealt with natural selection: Based on his understanding of conscious reflective selection, did Dewey reject Darwin's idea of natural selection, or, at the very least, found it to be not applicable for his social and educational philosophy and therefore altered it into something new in order to avoid externalism? And if so, how would that have been compatible with his aspiration to overcome the misunderstandings of Spencerian evolutionism while not falling back into the dualistic dead-end of traditional materialism?

While it is broadly agreed upon that Dewey's conception of growth is crucially informed by Darwinism to various degrees, the role of the concept of natural selection in the evolutionary foundation of growth has been disputed. Bellmann (2007, p. 17), for example, has argued that Dewey's interest in the theory of evolution was only partial, and his understanding of natural selection reduced to inducing learning adaptation, omitting redundancy and selective disconnection as successful evolutionary strategies in selective processes. Similarly, Popp's (2007) reasoning implies that while Dewey's growth indeed can be described as a core part of his naturalistic evolutionary ethics, "natural selection has been replaced by reflective conscious reflection" (Popp, 2007, p. 98). I argue, however, that a clarification of the concept of natural selection is able to enrich this discussion. In order to do so, I aim to entertain the idea that when it comes to natural selection, Dewey is compatible with Darwin, given we accept natural selection as a principle of existence and not as a binary mechanism (Asma, 1996, p. 5). From that point of view, it can only be maintained that Dewey draws from a 'new' or alienated concept of natural selection if, either, a limited adaptionist understanding of natural selection is falsely attributed to Darwin, or, such a generally adaptionist, or extreme externalist view is ascribed to Dewey, which would present a mismatch with his use of the idea of selection. I will build this argument firstly on reasons 'external' to Dewey's own theory, and secondly, on an analysis of both Darwin's and Dewey's understanding of natural selection.

Firstly, 'complying' with Darwin seems essential for Dewey's philosophy, considering his aspiration to overcome Spencer's evolutionism, which in many regards is opposing Darwinism. Dewey, in stark contrast to Spencer's broad neglect of Darwin, argues:

> Doubtless the greatest dissolvent in contemporary thought of old questions, the greatest percipient of new methods, new intentions, new problems, is the one effected by the scientific revolution that had found its climax in the *Origins of Species*. (Dewey, 1910/2008, p. 14)

Consequently, excluding, or even reconfiguring Darwin's core contribution of natural selection, simply seems like an incompatible thing for Dewey to do. Dewey wanted to overcome the teleological misinterpretation of Darwin's idea of natural selection and apply it extensively as an epistemological principle (Fesmire, 2015, p. 86). Dewey's aspired 'ultranaturalism', however, demanded an alternative approach to the attempt to alter the concept – such as it had been done by numerous social evolutionists before and after Dewey.

This leads us over to the second, and more important argument for thinking growth as based on Darwinian natural selection: Natural selection according to Darwin was not exclusively externalist, nor adaptionist, i. e. explaining phenomena exclusively in terms of their adaptive function, in a neo-Darwinian sense. In his definition of natural selection, Darwin indeed emphasised the functionalist "preservation of favourable variations and the rejection of injurious variations" (Darwin, 1859/1998, p. 64). Also, both Darwin and Dewey, in each their own battles against misinterpretations of what they thought to be the core of evolutionary thinking, potentially overemphasised the functionalist component of their theories – leading to the negligence of pluralist elements in their thinking (Asma, 1996, p. 2). The fact that Darwin's main contribution to the evolutionist movement of the 18th and 19th century was natural selection, fostered a misunderstanding of the concept as an all-encompassing causal mechanism instead of an overarching principle of existing. This understanding of every trait and phenomenon is explicable only in terms of how they serve adaptation. This has led to an adaptionist constitution of neo-Darwinism and affiliated disciplines such as evolutionary psychology (see Gould, 1997). Yet, as Offer (2010, p. 307) points out, neo-Darwinist selectionism misunderstands Darwin, who did not exclude non-selectionist evolutionary effective mechanisms.

As elaborated on above, functionality is at the core of Dewey's idea of growth. It allowed him to address both the teleological notions of development and evolution from the past, as well as the materialistic dualism that he sought to overcome. It is fundamental to his notion of unified, non-relativist and yet non-determined individual and social growth that included individual as well as societal agency in manifesting social progress. Part of this growth is adaptation as a substantiating, accumulating process. The intellectual development of the individual towards purposeful conduct – which is the basis of knowledge, morality, behaviour and social interaction – is accompanied by the continuous formation of habits: "Habits as organized activities are secondary and acquired, not native and original" (Dewey, 1922/2008, p. 65). As habits develop in accordance to the feedback the individual gets from its environment, they are a highly efficient form of environmental adaptation. The success of an action depends on its usefulness in the present, where usefulness refers to how it allows the organism to cope with what it encounters in the environment, which, in the case of humans, is foremost a social environment (Metz, 1961, p. 190). Yet, while habit formation can be seen as a widely externalist understanding of adaptation, Dewey's notions of foresight and reflective conscious selection require us to move away from an all-powerful environment consisting of adaptive pressure and single-sided negative or positive selection. Nonetheless, as I want to argue,

this did not require Dewey to alter the meaning of Darwinian adaptation guided by natural selection in his 'ultranaturalist' theory of mind and society: Natural selection can be validly used as an element of a pluralistic framework without being altered, accounting for cumulative adaptative capacity as well as allowing us to conceptualise strategies of stagnation and detachment of other traits. Despite the doubtless emphasis Darwin put on natural selection in his theory, he also included notions of structural conditions of growth, non-adaptive by-products of adaptations as well as traits entirely unaffected by growth: "Variations neither useful nor injurious would not be affected by natural selection, and would be left a fluctuating element" (Darwin, 1859/1998, p. 64). Hence, it is important to note that Darwin himself was not an adaptionist, or, what Godfrey-Smith characterised in reference to Spencer, an "extreme externalist" (Godfrey-Smith, 1996, p. 45; see also Wuketis, 2005, p. 76), but rather embracing the very explanatory pluralism that neo-Darwinist fundamentalists try to overcome. Natural selection and adaptation to environmental conditions are important, but not all-encompassing explanations for evolutionary processes producing variation.

Especially when it comes to explaining mind and culture in an evolutionary framework, natural selection understood not only as the main, but as the only working natural law causing nothing but adaptation, is, according to Gould (1997), an invalid equation of cultural development with the fundamentally processes of biological evolution. "Turning a useful principle into a central dogma with asserted powers for nearly universal explanation" (Gould, 1997, p. 14), however, as I want to argue, is not what either Darwin or Dewey implied, when they accepted natural selection as a "paramount law" (Gould, 1997, p. 1). I want to propose that Dewey actually offers a highly useful alternative to the non-satisfactory binary coded interpretation of natural selection as adapted/not-adapted. Dewey emphasises that "the belief that natural selection has ceased to operate rests upon the assumption that there is only one form of such selection […]. There is not only the trial by death, but there is the trial by the success of failure of special acts" (Dewey, 1898/2008, p. 51). When Dewey conceptualises growth as conscious intelligent selection in all directions, including redundancy and disconnection, he is not 'alienating' Darwin's concept of natural selection, but rather trying to rescue it from the misperception of Spencer, who "identifies the principle of justice […] with natural selection and the elimination of the unfit in the struggle for existence" (Dewey, 1932/2008, p. 251), by broadening it.

Because Dewey relied on Darwin's non-adaptionist concept of natural selection, it also necessarily involved non-adaptive movements, such as in particular, consciously reflected detachment from, respectively focus on certain environmental demands: "The possibility of choice is involved in the nature of attention. In so far as we attend to the thought, we can but act upon it" (Dewey, 1902/2008, p. 131). Individuals are not just blindly adapting themselves to whatever comes their way, but rather follow a "selective bias in interactions with environing things" (Dewey, 1925/2008, p. 196): "In the end, men do what they can do. They refrain from doing what they cannot do. They do what their own specific powers in conjunction with the limitations and resources of the environment permit" (Dewey, 1910/2008, p. 49). Hence, I want to argue that Dewey's idea

of growth as continuous conscious selection can indeed be combined with a Darwinian concept of natural selection, which in itself encompasses a variety of adaptive strategies, including selective adaptation, and active environmental intervention as an adaptive strategy.

Dewey's emergent theory of mind enables him to locate human cognition within evolution without taking a deterministic stance; the ability to grow intellectually, to learn from experience and to find ends to situations guided by foresight derives from human evolution and is not to be located in a spiritual realm outside of it. Adaptation and learning, for Dewey, are based on conscious processes of selecting ends and means:

> Having this end of his own, the child then notes other persons, as he notes natural events, to get further suggestions as to means of its realization. He selects some of the means he observes, ties them on, finds them successful or unsuccessful […] and so continues selecting, arranging, adapting, testing, till he can accomplish what he wishes. (Dewey, 1933/2008, p. 285)

Hence, adaptation is complex, on-going assimilation and accommodation of an intelligent agent in a socially constrained spectrum of adaptive options.

Dewey's acceptance of Darwinism stands in contrast to the conservative approaches of Spencer for example – where the environmental pressure was seen as a teleological force guiding the organism towards a certain end. Dewey assigned more power to the individual in regards to its environment. Through the formation and re-formation of the individual's habits that guide its actions, the individual is able to deal intelligently with its environment and thereby is actively involved in it and not only undergoing it: "A habit means an ability to use natural conditions as means to ends. It is an active control of the environment through control of the organs of action" (McDermott, 1981, p. 488).

6. Growth and Education

The relevance of the concept of growth for Dewey's educational works is not contested. In fact, his definition of education as the "reconstruction or reorganization of experience which adds to the meaning of experience, and which increases ability to direct the course of subsequent experience" (Dewey, 1916/2008, p. 76) shows, that education *is* growth (see also Dewey, 1915/2008, p. 211; Dewey, 1934/2008, p. 196). In connection with this key role of his notion of growth, Dewey was frequently accused of draining education of purpose and turning it into a social action driven by complete relativity (see on this Pring, 2007, p. 26). Critics rejected the idea that growth could serve as an end in itself; they argued that it had to lead to something particular – namely, an ideal. However, following my analysis, and the case I made for assuming a non-adaptionist concept of natural selection as a core foundation of growth, I argue that the accusation of relativ-

ism is only plausible if the strong evolutionary background of Dewey's educational theory is neglected and his functionalism is conflated with an 'anything-goes' relativism. Dewey's focus on *the present* illustrates the significance of the evolutionary paradigm on his concept of growth. This allowed him to argue in strong opposition to "'traditional education' – that is, the systematic transmission of knowledge" (Pring, 2007, p. 27).

From a Darwinist perspective, what is 'useful' can only be judged by its applicability in the present and the adaptive advantage it grants – this is true for individual conduct and action, as well as for societal growth. Dewey was, what Rorty called an "edifying philosopher" (Rorty, 1979, p. 367), who was interested in processes rather than objective aims. However, as I have argued, this does not imply relativity in the sense of 'anything goes', but rather it suggests an environmental dependence of what is 'good' and desirable, or, 'bad' and undesirable, in educational processes. Hence, it seems, the specific relationship between individual and the societal environment that drives adaptive movements in both directions, is shaped the way it is – and in that highly useful for educational reflection – not because Darwinian natural selection has been altered, but much rather, because it has been preserved by stripping it from its essentially anti-Darwinian adaptionist misconception.

The suggested Darwinist reading of Dewey's conception of growth as building on Darwinian natural selection, has at least two profound implications for education and *Bildung:* (1) It informs our understanding of the profound incompatibility between current learning environments following an economic, output oriented logic, and the educative experience in the sense of Dewey, and (2) it provides an interesting perspective on the twofold task of schools to ensure individual growth *and* societal growth without instrumentalising the former for the sake of the latter.

With respect to point one, English (2013) points out the significance of experiences of discontinuity for the further development of existing habits and the re-establishing of continuity in experience as constitutional to growth. In that, growth is understood as an increase in adaptive capacity, which is not to be confused with qualitatively increasing adaptation. With natural selection at the core of "the general principle of evolution – development from the undifferentiated toward the formation of distinct organs on the principle of division of labour" (Dewey, 1902/2008, p. 82) no directionality inherent to processes of growth has to be presupposed, while it also necessarily includes conscious decision of detachment, i. e. division of labour. The only thing that is indeed cumulative in Dewey is growing capacity. However, even this growing capacity is not straight forwardly additive – as Popp (2007, p. 99) points out, due to the understanding of evolutionary processes as emergent, new, unseen problems will always arise. Building on this understanding of as adaptation, I argue, the potential of stagnation, disconnection and devolution are always included.

As established above, in order for experiences to be educative, they have to allow for a productive engagement with the in-between of discontinuity and continuity. When thinking about how growth can be cultivated in formal education, a problem arises when schooling is increasingly following parameters external to the child, such as economic or political agendas. English (2013) points out that part of the aim of teaching and

learning is to ensure the learner's exploration within an "in-between realm of learning" (English, 2013, p. 55). The "in-between realm of learning" that comes about from learners' encounters with their own limitations, their own perplexities and problems, cannot emerge from a schooling environment that ignores the student's experiences, and constructs outcomes to be achieved, independent of the process of learning and growth. In this realm the teacher allows and even actively cultivates situations for learners' negative experiences, that is, their productive encounter with limitations of knowledge and ability that lead to doubt, confusions or even frustration; yet, this is not possible within our present climate of "emphasis on outcomes and results" in international educational policy (English, 2013, p. 55).

Dewey criticised the way school addresses children as 'pupils' and not primarily as human beings, suggesting that the problem lies in the fact that the aims of education are not "founded upon the intrinsic activities and needs (including original instincts and acquired habits) of the given individual educated" (Dewey, 1916/2008, p. 114). Instead of dealing with the problems that emerge from his or her actions, social relations and the immediately present environment, the student's task becomes one of "find[ing] out what the teacher wants, what will satisfy the teacher in recitation and examination and outward deportment" (Dewey, 1916/2008, p. 163). A one-way externalism – as opposed to Dewey's selective, intelligent externalism – is the consequence, limiting learning as adaptation to the individual adapting to an environment that remains widely fixed. The possibility for the reciprocal process between doing and undergoing, which constitutes educative experience, becomes precarious:

> Activities which follow definite prescription and dictation or which reproduce without modification ready-made models […] do not require the perception and elaboration of ends, nor […] do they permit the use of judgement in selecting and adapting means. (Dewey, 1916/2008, p. 205)

The possibility of a genuine 'falling in and out' of continuity becomes a crucial point of reference to determine the quality of experience; it serves as a normative "to discriminate between experiences which are educative and those that are miseducative" (Dewey 1938/2008, p. 20). Educative experiences are experiences that allow the individual to build on previous experience and therefore increase meaning and support "the growing, enlarging, liberated self [that] goes forth to meet new demands and occasions, and readapts and remakes itself in the process" (Dewey, 1938/2008, p. 308). From this process and growth oriented educational perspective follows Dewey's emphasis on the need for schools to assess the kind of experience they cater for (see Benner, 2017). This understanding of growth as a standard for truly educative experiences engenders a strict focus on the present. Dewey laments:

> It has been thought that the doctrine of evolution means the complete subordination of present change to a future goal. It has been constrained to teach a futile dogma of approximation, instead of a gospel of present growth. (Dewey, 1922/2008, p. 197)

As a consequence, education for Dewey is not a process of "getting ready" (Dewey, 1916/2008, p. 59), but rather life itself.

This leads us to the second point above: Can schools ensure individual and societal progress in the way Dewey's idea of growth implies? Education is responsible for both ensuring "continued growth of intelligence, both ontogenetically and phylogenetically" (Popp, 2007, p. 90). From the way Dewey integrates a Darwinian non-adaptionist notion of natural selection, follows the necessity of allowing the individuality of *ends* in education, i. e. there should be no aim of education but intellectual growth itself (Dewey, 1916/2008, p. 54). In this, growth has no end beyond itself; it works according to the non-teleological and continuous mechanism of natural selection (Stitzlein, 2017, p. 39; Popp, 2007, p. 98). "The educational process is one of continual reorganizing, reconstructing, transforming" (Dewey, 1916/2008, p. 54). It follows that it is not the *ends,* but rather the *means* to reach the chosen end, which formal education should be addressing. To do this, schools must provide a "specially selected environment […] on the basis of materials and methods specifically promoting growth in the desired direction" (Dewey, 1916/2008, p. 43). By using a Darwinist framework and giving growth a two-fold meaning – as the merging of societal and individual development – Dewey theoretically dissolves the dualism that form the basis for the seemingly incompatibility of school as an institution of cultural transmission and individual development. "Social progress is an 'organic growth', not an experimental selection" (Dewey, 1916/2008, p. 65) Natural selection as a guiding principle is important for this dissolution, as it allows Dewey to conceptualise non-relativist organic growth, based on functionality with societal growth, and yet, by assuming a moderate externalist position, maintain democratic individual agency.

7. Conclusion

While Spencer's interest in education was merely instrumental – i. e. he wanted to test out his universal theory of evolution on the case of education (Andreski, 1971, p. 7) – Dewey formulated an educational theory based on an evolutionary framework, engendering notions that were both Darwinian *and* educational. Growth is at the very centre of his approach, which he constructed largely in opposition to his contemporaries.

Dewey's idea of growth is based on the idea of intelligent selection of means and ends, "that is with the selection and arrangement of means to effect consequences and with choice of what we take as our own ends" (Dewey, 1929/2008, p. 171). I have argued in this paper, that Dewey's concept of intelligent selection and growth are fully compatible with Darwinian framework. This reading of growth is educationally useful as it conceptualises an active, intelligently acting individual agent in a constraining yet not determining environment, guiding, but not directing, societal and individual growth in the same process. The idea of functional adaptation is the starting point of Dewey's educational theory – an idea that runs throughout his works. Following this, the educational philosophy that Dewey proposes can be described as the fundament to an es-

sentially evolutionary educational theory. This 'ultranaturalist' aspiration of his theory is also founded in the contrast to his contemporaries. From the beginning of his intellectual career, Dewey emphasized the present functionality and the intellectual process of determining this functionality instead of prefixed ends and outcomes in contrast to Spencer and other teleological Darwinians. With this contrast he significantly contributed to the establishment of philosophy of education as a separate discipline in the US (see Kaminsky, 1992).

If we think about formal education today, we have to consider how learning environments can be, and must be, artificially constructed, and still truly educational, that is, growth-enabling environments (see Stitzlein, 2017, p. 42). Dewey points towards the necessity of constructed, "simplified" (Dewey, 1916/2008, p. 25) learning environments in complex societies whose knowledge tradition is predominantly reliant on written symbols: "Written symbols are even more artificial or conventional than spoken; they cannot be picked up in accidental intercourse with others" (Dewey, 1916/2008, p. 24). However, translating Dewey's notion of artificiality into practice presents a challenge if we look at today's society. The current ideas of schooling as a means for fulfilling political, economic, as well as social and environmental agendas raises questions around what we define as educational environments and how we judge the kind of experiences they enable. According to Dewey, "the act of learning or studying is artificial and ineffective in the degree in which pupils are merely presented with a lesson to be learned" (Dewey, 1916/2008, p. 143). It seems to be exactly that kind of ineffective artificiality – as opposed to an artificial and still educational experience – that the current neoliberal educational discourse evokes. Producing considerable influx of non-educational notions, it introduces to education "a new obsession with assessment" (Saito, 2005, p. 139), which excludes all immeasurable non-representable entities. According to Apple (2016) and Giroux (2016) the economical jargon accompanying this neoliberalist obsession is a new form of Social Darwinism, based on a survival of the fittest ethic.

These superimposed standards co-constructing educational environments have to be assessed regarding the way they enable or hinder truly educational experiences. Dewey's theory is not only able to highlight this issue, but also enrich it. A Darwinian reading of Dewey's concept of growth combines open-endedness and functionality with respect to the learners' processes of acquiring knowledge and ability, and requires freedom in the sense that it allows for a multitude of paths and solutions (Pring, 2007, p. 117); the learning process cannot be entirely pre-determined because it has to stay open and plastic to cater for individual needs (English, 2013, p. 87). Therefore, following Dewey, we must consider that formal education that is designed to serve pre-defined economic outcomes or some self-serving agenda of a given political leader fails to meet a fundamental criterion of educational aims: to enable all people to contribute to the negotiation and evaluation of what society can and should look like.

Schools today are at risk of failing to allow for the kind of intelligent experience that supports growth. "The teacher who does not permit and encourage diversity of operation in dealing with questions is imposing intellectual blinders upon pupils" (Dewey,

1916/2008, p. 182). Dewey is accentuating the need for teachers to be supportive of learners' experiences of insecurity or perplexity in dealing with new problems, and of the openness and uncertainty of outcomes, because this can be productive in leading to growth. Education *(Bildung),* as Dewey had envisioned it, requires freedom – freedom to find aims and the freedom to act on them. Considering the effective governing of schooling by supra-national organisations superimposing education and pedagogy with a neoliberal agenda, the full vision of how the teacher is to 'adapt' to the formal constraints and still facilitate growth remains unresolved. It seems that looking to the future of the common school – an idea that continues to be called into question in the US, UK and elsewhere – we have to seriously consider the extent to which schools are able to provide this freedom, and how to ensure that every child has access to experiences of growth.

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Zusammenfassung: John Deweys Beitrag zur Herausbildung und Weiterentwicklung einer anti-deterministischen und nicht dualistischen Art der evolutionstheoretischen Argumentation in der Pädagogik bleibt oft unbeachtet. Mittels der Analyse von Deweys Konzept 'growth' – welches ebenso die zentralen Ideen von Deweys Erziehungsverständnis wie auch seiner Darwinrezeption umfasst – soll der Einfluss der Evolutionstheorie und insbesondere Darwins Idee der natürlichen Auslese auf Deweys pädagogisches Werk illustriert werden. Damit will der Beitrag unser allgemeines Verständnis von Deweys Erziehungstheorie vertiefen und gleichzeitig eine neue Perspektive eröffnen auf das Verhältnis der derzeit vorherrschenden Wirtschafts- und Ergebnisorientierung von Lernumgebungen und bildender Erfahrung im Sinne Deweys.

Schlagworte: Dewey, Darwinismus, 'growth', Natürliche Auslese, Neoliberalismus

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