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The Problem of *Bildung* and the Basic Structure of *Bildungstheorie*

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Abstract In this article, an attempt is made to introduce a systematization of the loosely connected group of authors called *Bildungstheorie*. This ought to not only be of significance for German-speaking educational science, for the concept of *Bildung* is also increasingly used internationally for the formulation and development of pedagogical issues. It is proposed that the concept of complexity could be suitable for bringing attention to common presuppositions in the theoretical dealing with the problem of *Bildung*. The thesis is that *Bildung* in theories of *Bildung* is described from various perspectives as complex, meaning it is an open and uncertain interplay of components irreducibly associated with planning and governance problems. As this thesis is corroborated by means of selected positions within *Bildungstheorie*, evidence is provided that complexity in educational science—differently than it may seem at first glance—is not for the first time today a theme of importance. Rather, it is demonstrated that a nascent discipline-specific complexity research can be linked to already existing traditions.

Keywords *Bildung* · *Bildungstheorie* · Complexity · Basic structure · Openness · Uncertainty

Introduction: Philosophy, *Bildung* and Complexity

Modern democratic societies are today described as complex societies. Regardless of the academic field, there is seemingly omnipresent talk of complexity (of course, without there always being a clear definition of complexity). In Sociology, there has long been talk of a

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"Complexity Turn" (Urry 2005) that has supposedly encompassed not only science,[1] but society in its entirety. With a view to science it is evident, according to John Urry, that complexity is advancing as a subject of research in more and more disciplines.

In the meantime, the "Complexity Turn" has also encompassed educational science.[2] The basic assumption of an educational-scientific complexity research is (in essence) summarized as follows: "Education is a complex system, with all the properties that are characteristic of a complex system." (Jörg et al. 2007, p. 149). From the perspective of Jörg, Davis and Nickmanns, up to now educational science has not given this fact adequate consideration. Accordingly, in the opinion of the authors, it is of urgent necessity to dispense of old patterns of orientation and in their place develop "new tools of thought" (ibid., p. 151). "An innovative science, based on new thinking in complexity" (Jörg 2009, p. 9)—a growing number of international educational scientists seem to orientate around this vision (see among others Davis and Sumara 2006; Osberg and Biesta 2010). This is also true of philosophers of education (see Mason 2008).

In contrast to the position formulated by Jörg, Davis and Nickmans, in this article we aim to demonstrate that the theoretical dealing with complexity in educational science possesses implicitly an already long-standing tradition. In the German-speaking world, this tradition is called *Bildungstheorie.* As Dietrich Benner points out, *Bildungstheorie* is traditionally the place in educational science where the problem of the "tasks and purposes" of education is discussed. In contrast to this, according to Benner, the problem of the correct "manner" of educational activities stands at the center of *Erziehungstheorie* (Benner 2010, p. 150). While it ought to be widely known that there is no such thing as a uniform concept of *Bildungstheorie* (see Klafki 1986/2000 pp. 86ff; Horlacher 2016), what generally is referred to as *Bildungstheorie* proves to be a loosely connected group of authors on closer inspection, one that continuously produces new descriptions of *Bildung*. However, a commonly shared definition of *Bildung* doesn't exist.

Should it be accepted that theories of *Bildung* could be interpreted so to speak as theories of complexity *avant la lettre,* the concept of complexity could even be suitable for introducing a *systematization* of theories of *Bildung*. This is precisely our thesis. We aim to demonstrate that the concept of complexity can be used for the purpose of taking a previously unfamiliar look at the *basic structure* of *Bildungstheorie* and in doing so provide an important contribution to the clarification of educational-scientific theory construction.[3] *Bildung*, so it is claimed, is described in various theories of *Bildung* as *complex,*

[1] 'Science' is to be understood here in the broad sense of the German word *Wissenschaft*, encompassing the sciences and the humanities (see Hoyningen-Huene 2013).

[2] Our terminology in this article is influenced by the academic study of education in the German-speaking world. This form of academic study differs significantly from that in the English-speaking world, where 'educational studies' designates generally a multidisciplinary field. This field includes, among others, disciplines such as psychology, history, sociology and philosophy. In contrast to this, there is a specific academic discipline in the German-speaking world that deals with education (see Biesta 2013a, pp. 8ff). This discipline is called either 'pedagogy' *(Pädagogik)* or 'educational science' *(Erziehungswissenschaft)*. For reasons of space we cannot go into details about historical and/or theoretical differentiations between these two concepts. Instead, we would like to briefly point out the place of philosophy of education *(Erziehungs- und Bildungsphilosophie)* in pedagogy or educational science respectively. As will be shown in more detail, philosophy of education shall mean the *methodically controlled reflection on the theoretical and methodical presuppositions of educational knowledge*—a reflection, which is located in educational science itself (Tenorth 2016, p. 52).

[3] In order to avoid possible misunderstandings, we would like to explicitly note that we are not concerned with a clarification of the basic structure of *Bildung* (see Ballauff 1953). Rather, we aim to examine the basic

meaning it is an open and uncertain interplay of components irreducibly associated with planning and governance problems.[4]

In order to corroborate the thesis, and thus also provide evidence that complexity in educational science has not only recently advanced as a theme, we primarily draw on German-language authors.[5] Such a recourse takes into account that the concept of *Bildung* is mostly used within German-speaking educational science, for this concept is not identical with the concept "education"—nor with "liberal education" (see Stojanov 2012, p. 75f). Nevertheless, the article ought to be of relevance beyond German-speaking educational science, as pedagogical issues are increasingly discussed internationally with regard to the concept of *Bildung* (see Løvlie et al. 2003; Siljander et al. 2012). Yet in philosophical writings as well, a recourse to the concept of *Bildung* is to be found time and again (see Emerson 1830/1983; McDowell 1996, p. 84; Bakhurst 2011). In the English-speaking "Philosophy of Education," in fact, *Bildung* is identified as one of its "key concepts" (Winch and Gingell 2008, pp. 23ff); however, up to now there has not been any attempt to clarify the connection between the concept of *Bildung* and the concept of complexity.

We consider the clarification of the concepts of complexity and *Bildung*, as well as the definition of their relationship to be among the central tasks of a "Philosophy of *Bildung* and education" (Ruhloff 2001). At the same time, we define philosophy of *Bildung* and education as a perspective of reflection. From this the specific presuppositions of theories of *Bildung* und education can be addressed and problematized. "In contrast to the *intentio (di)recta*—which determines the affirmative knowledge of educational science as well as pedagogical practice and policy—philosophical questions arise from an *oblique* intention (…). In the *direct* intention of recognition and action, certain aspects remain self-evident presuppositions (…). This is inevitable." (ibid., p. 60). In contrast to this point, "one can say that the problems related to presuppositions constitute the subject matter of philosophy of *Bildung* and education" (ibid., p. 61). In this sense a *philosophic* access to education and *Bildung* does not lead to a theoretical description of these subjects. Rather, such an access exists in reflecting on the *presuppositions* (concepts, assumptions, argumentation figures, methods etc.) of available theories of *Bildung* and education (see Fischer 1997). This is precisely what we will do below, by describing, with recourse to the concept of complexity, basic structures in the theoretical dealing with the problem of *Bildung*.

This access is associated with specific limits, which we would like to bring attention to in order to avoid excessive expectations. By taking the perspective of *philosophy* of *Bildung* and education, we do not intend to create a new theory of *Bildung*. Our focus is solely on the *presuppositions* of already *given* descriptions of *Bildung*.

Furthermore, our approach is *systematically* oriented. That means, *on the one hand*, that we will abstract from the *genesis* of the mentioned descriptions (see Ruhloff 2001, p. 62).

Footnote 3 continued
structure of the *theoretical dealing* with the problem of *Bildung*. In this perspective of reflection *Bildung* itself only comes into view via already existing descriptions of *Bildung* (see Luhmann 1992, p. 668).

[4] This does not mean that *Bildung* is ultimately described *identically* in theories of *Bildung*. Instead, we argue that the complexity of *Bildung* in various theories of *Bildung* can and will be spelled out in *different* ways. It makes a difference whether, for instance, the openness of *Bildung* is associated with ideological criticism (see Bünger 2013, pp. 175ff) or with transcendental criticism and skepticism (see Ruhloff 2004, pp. 389ff). This, however, does not alter the fact that *Bildung* in either case is described as a process that is not finalized to an already fixed state.

[5] We have made an effort to quote texts already available in English. For the cases in which this was not possible we undertook the corresponding translations.

The presuppositions, which we will discuss, are therefore not to be confused with the formation conditions of a theory—whether these are biographical, cultural or ideological (see Tröhler 2012). Instead, it is our concern to clarify the presuppositions, which have to be claimed as valid, so that *Bildung* can be described in a specific way (see Tenorth 1988). *On the other hand*, a systematic access is characterized by establishing *relations* between the presuppositions of different theories of *Bildung*. Such an epistemological interest is based on the assumption that there are presuppositions that *transcend* specific theoretical and/or historical contextual conditions (which does not imply that the presuppositions discussed here are without dependence to *any* context). Whether this is actually the case cannot be decided in advance of the study, but must be proved in the investigation itself.[6]

In this paper we aim to demonstrate that there are, in fact, commonly shared presuppositions of *Bildungstheorie*. By systematizing descriptions of *Bildung* in relation to parameters of *complexity*, our perspective once again gets more specific. On the one hand, a complexity-theoretical perspective opens up an original possibility of systematization; on the other hand, this perspective leads to the fact that only a *restricted* view can be taken on the basic structure of *Bildungstheorie*. An alternative access may lead to another description of the mentioned basic structure.

Last but not least, we would like to point out that we can substantiate our assertion only by selected positions. In order to confirm our findings, the present investigation remains dependent on further studies that involve additional theories of *Bildung*.

After these preliminary remarks we would like to start now our analysis of the problem of *Bildung* and the basic structure of *Bildungstheorie*. For this purpose, it is first necessary to clarify the concept of complexity.

Open and Uncertain Dynamic, Planning and Governance Problems

Without a doubt, complexity research does not constitute a uniform discourse. Complexity researchers operate instead with various theoretical approaches, deploy different methods and test both on different subjects (see among others Richardson and Cilliers 2001; Bogg and Geyer 2007; Mitchell 2009; Byrne and Callaghan 2013). In our opinion, it is nevertheless possible to at least delimit the discourse through a clarification of the *concept of complexity*. As we attempt to demonstrate below, this concept refers to an interplay of components, that underlies an open and uncertain dynamic, and thus poses serious planning and governance problems.[7]

From the complexity-theoretical perspective, a subject is viewed as an irreducible *interplay of components*. The concept of interplay denotes a circumstance in which the components of a subject find themselves in mutual dependence. To investigate a subject in its complexity thus means above all to focus on the interplay of components, and to clarify "how these elements interact" (Merry 1995, p. 58).

[6] Against this background, we refer to authors who can be attributed to different theoretical contexts. We focus primarily on contemporary theories of *Bildung*. However, our analysis also takes into account theories of older dates. An investigation of different theories of *Bildung* relative to specific contextual conditions has recently been presented by Horlacher (2016).

[7] In contrast, for everyday language another concept of complexity is characteristic: "When someone says, 'It's complex. It's very complex!', the word 'complex' does not constitute an explanation, but rather indicates the difficulty in explaining. The word serves to designate something we really can't explain, but that we shall call: 'complex.'" (Morin 2008, p. 84).

In the interplay of components, the *development, maintenance* and *change* of *order* have their place. In complexity research these processes are defined by the concept of *dynamic*. Many complexity researchers describe dynamic as an interaction between *self-organization* and *chaos*: "Complexity research concerns itself from an interdisciplinary perspective with the question of how, through the interaction of many elements of a complex system (e.g. molecules, cells in organisms or people in markets and organizations), orders and structures can develop, as well as chaos and breakdowns" (Mainzer 2008, p. 10; Mainzer 1997).

Complexity researchers speak of self-*organization*, as *orders* develop, maintain, and are changed, that structure the interplay of components for a certain period. These processes are labeled as *self*-organization, since orders develop, maintain and are changed not only in accordance with external factors, but also within the interplay of components. The respective order has an "attracting" effect on the interplay of components, and is thus also referred to as an *attractor*. In a state of attraction, the interplay of components undergoes a temporary stabilization. The orders that complexity researchers describe are consequently not static formations, but rather an interplay of components that for a certain period is stable without the need to remain fixed in this state (see Kriz 1996; Morin 2008, pp. 5f and 40ff). "Maintenance" thus does not mean that "nothing happens," but rather that processes stabilize for a certain period before the order is again destabilized and transformed.

For the state of temporary disorder that accompanies the development of a new order, there is in complexity research the concept of *chaos*. Chaotic states are thus characterized either by the lack of a preceding order or the destruction of an existing one. In front of this background complexity researchers describe both the development and change of order as *phase transitions*. In doing so, there are two fundamental types of phase transitions to distinguish (see Strunk and Schiepek 2006, pp. 80f): "Order–Order-Transitions" commence so that order becomes unstable and a process of destruction sets in. This eventually leads to the transformation of order. In this perspective, the destruction of order is in effect the precondition for its transformation. Order in phase transitions can, however, also develop from a state of disorder. Such processes are referred to in complexity research as "Disorder–Order-Transitions."

Both types of phase transition have the development of a *new* order in common. At this point the concept of *emergence* comes into play. Complexity theorists define chaos as a necessary precondition for emergence. "In a universe of pure order, there would be no innovation" (Morin 2008, p. 63; see Eisenhardt et al. 1995, p. 254). In this sense chaos possesses not only a *destructive*, but also a *constructive* element. Only chaotic states establish the possibility for the development of a new order. The latter is provisionally concluded once a phase of stabilization sets in, and order no longer develops or transforms, but is maintained. However, the maintenance phase is not necessarily perpetuated. Each developed or transformed order can again in the future be destroyed and transformed.

The dynamic of complex subjects is described by complexity theorists as open to the future. *Openness* means that the dynamic is not finalized to an already fixed state. In complexity research the future is understood, rather, as an unfathomable space of possibilities. That again signifies, that complexity theorists label the dynamic not only as open, but at the same time as *uncertain*. It is to be seen in the "situation of fundamental uncertainty" (Driebe and McDaniel 2005, p. 20) that orders, those that emerge within the interplay of components, cannot be successfully predicted. To put it plainly: "We do not know what is coming next" (Goldenfeld and Kadanoff 1999, p. 87; see Nowotny 2016, pp. 128ff). Rather, the opposite is the case: The dynamic can repeatedly surprise us, as the development, maintenance and change of order takes a course, which we had not expected and maybe also had not hoped for. "Complexity science has taught us to expect the

unexpected" (Driebe and McDaniel 2005, p. 19). In this sense openness and uncertainty are understood as two sides of the same coin.

With that said, the fact that complex subjects can always surprise us, an orientation to the concept of complexity always means to anticipate *planning problems* (see Sanders 1998). Planning means that future actual conditions are mentally conceptualized, and that actions are determined that appear suitable either for—when desired—implementing or—when undesired—preventing, the respective conditions. Complexity researchers now warn that predictability at best is valid for simple and complicated subjects; but not for the complex. Instead they attempt to show that among the conditions of complexity, nothing assumes that planning can be successfully implemented.

Complexity researchers see the origins of this circumstance in the openness and uncertainty of the dynamic. In the perspective of complexity theory, "planning failure" is "not the result of an insufficient description of the system" (Krohn and Küppers 1990, p. 115), but rather is conditional upon its "unpredictable development." (Küppers 1996, p. 170) As a result, planning acquires the character of an experiment linked to expectations and hopes. These can be fulfilled, but also disappointed.

In addition to planning problems, complex subjects present further *governance problems*. The concept of governance *(Steuerung)* refers to the intervention in a situation with the purpose of transferring this from one condition to another specific condition. In contrast to simple and complicated subjects, the use of interventions to achieve certain conditions is not possible in the case of complex subjects. Rather, in complexity research it is warned that interventions can lead to *unexpected consequences and side effects* (see Glouberman and Zimmerman 2004, p. 23). Complexity research attempts to account for this internal dynamic, among other things in the switch of governance to control *(Kontrolle)*. "'Control' at this juncture does not mean an attempt to still prevail when one no longer understands (…). 'Control' means (…) in dealing with the surprises of a complex phenomenon, to correct one's expectations, to refresh one's memories, and thus preferably to learn rather than insist." (Baecker 2007, p. 109).

We cannot discuss more in-depth the switch from governance to control and its implications at this point. Instead, we would like to turn to the question, whether, and if so, how the concept of complexity could be suitable for bringing attention to the commonly shared presuppositions of theories of *Bildung*.

On the Problem of *Bildung* and the Basic Assumptions of *Bildungstheorie*

At the beginning of this article we referred to *Bildungstheorie* as a loosely connected group of authors. In this section we would like to pursue the question, whether, and if so, to what extent it is possible to introduce a systematization of the descriptions of *Bildung* produced by these authors. To develop such a systematization seems indispensable to us for the reason alone of being able to discuss commonalities, differences, possibilities and borders of different theories of *Bildung*. Yet, we also want to be able to sound out potential points of connection.

Our thesis is that the discourse of *Bildungstheorie* can be systematized, both in a thematic as well as theoretical aspect. Under the *thematic* aspect, we thereby follow Heinz-Elmar Tenorth, who proposes to understand the "modern conception of human development" (Tenorth 2016, p. 56) as the common subject described in various theories of *Bildung*. We expand upon this proposal below around the assumption, that amid the

various theoretical accesses to the subject in question, there are also commonalities we would like to refer to here as the *basic structures* of *Bildungstheorie*. A clarification of these basic structures shall be central to the following deliberations (see Rucker 2014).

But what does such an attempt at clarification has to do with complexity? The thesis is that it is the concept of complexity that introduces the possibility of describing the above mentioned basic theoretical structures. Below we aim to corroborate this thesis with the help of selected descriptions of *Bildung*. These will be systematized in light of the established parameters of complexity.

To describe *Bildung* as complex means that it must be defined as an irreducible interplay of components. Wilhelm von Humboldt made this element an explicit subject of discussion, as he defined *Bildung* as a "linking of the self to the world" that possesses the form of "interplay" (Humboldt 1793/2000, p. 58). In this *interplay* an individual deals *self-actively* with the world. In the self-active dealing with the world the individual determines his relationship to self and the world.

The interplay of the individual and the world is more narrowly defined by Dietrich Benner as an interplay of dealing with the world *(Welttätigkeit)* and reflection *(Reflexion)* (see Benner 2010, p. 84ff). *Dealing with the world* can take on diverse forms: A person studies a book, helps another person in distress, explores a painting, celebrates worship with other people, conducts an experiment, discusses a political issue with other people, etc. From the perspective of *Bildungstheorie* engagement with the world is a condition for the self-determination of rules of orientation by the individual. "For pedagogical tradition was […] always certain that the condition of possibility for *Bildung* is dedication to an objective task" (Blankertz 1979, p. 43f). This is a *necessary*, yet *insufficient* condition for *Bildung*. "Self-activity" (Mollenhauer 1983/2013, p. 84ff) is only valid when dealing with the world is connected to reflection and vice versa. "Only if a person brings reflective activity to bear on unreflective activity can it be said that he or she (…) engages in his or her own *Bildung* (ibid., p. 87)." In reflection, the individual positions himself in relation to self and the world.

Reflection is directed both towards the *past* as well as *future* engagement of a person with the world. On the one hand, in reflection an *experience (Erfahrung)* that results from dealing with the world, becomes related to the rules by which a person orients himself in judgment and action. In this respect rules of orientation can also be referred to as the *positions* relevant *(maßgeblich)* for a person within a specific period of development. On the other hand, in reflection a person is actively conceptualizing, meaning that he defines rules of orientation for himself. With the resulting *design (Entwurf)*, however, the process of *Bildung* in no way comes to an end. *Bildung*, understood as an *interplay* of the individual and the world, not only *starts with* engagement with the world, but—conveyed via experience and design—also *leads to* dealing with the world.

The *dynamic* of *Bildung* is marked—sometimes explicitly—as the development, maintenance and change of orders of the relationship to self and the world (see Marotzki 1990). The *development phase* is thus identified, that a person designs a rule in relation to a previously unfamiliar situation and complies with this rule in future dealing with the world. In the *maintenance phase* a person judges and acts in relation to self and the world in the context of each developed position. In do so, a person orients himself towards rules that he beforehand developed. In doing so, it is decisive that a rule in the maintenance phase is presupposed to be unproblematic. Only under this condition will an order be maintained for a specific period. Connected to the maintenance phase is the *change phase*. In contrast to the previous phase, an until now relevant rule of orientation fails. The phases of maintenance and change are insofar linked together by a *phase of destruction* in which a person

experiences a rule as problematic. This disruption and accompanying destabilization of a position are described in theories of *Bildung* as a condition of becoming a different person (see Ricken 1999).

In the perspective of educational-scientific complexity research, the development and transformation of positions are marked as *phase transitions*. The development phase of a position then forms a *disorder-order-transition*. In this case there is no rule available to a person in order to take a position in relation to self and the world. A person is thus initially confronted with a state of disorder. In contrast, the transformation phase of a position marks an *order–order-transition*, which is conveyed via a phase of destruction.

In this sense, *Bildung* is described in *Bildungstheorie* as an *interplay of self-organization and chaos.* As *self-organization* of *Bildung* we identify the fact that positions develop, maintain and are changed not only in accordance with external factors, but also in the interplay of dealing with the world and reflection. Reflection is the place where it is decided, whether, and if so, to what extent positions in light of specific experiences can still be defined as relevant or must be changed. In the first case it is a matter of positive experiences, in the second a matter of negative experiences. *Positive experiences* are those that can be subsumed under rules, which prevent a position of disruption. Experiences, in contrast, that bring attention to a problematic position, are called *negative experiences* (see Benner and English 2004). These appear subversive against already developed positions (see Meyer-Drawe 2015). In the case of a negative experience the world provides resistance to rules of orientation. It does not acquiesce to a person's every arbitrary judgment and action, but contributes in its resistance to order's reversion into chaos.

This state of temporary disorder serves as a precondition for the development of new orders of the relation to self and the world. *Emergence* in this sense is based on a condition that Hans-Christoph Koller refers to as "experience of crisis." Here Koller determines "when humans are confronted with certain problems without being provided with the means necessary for solving them" (Koller 2011, p. 377). This condition therefore sets in, either, because a person does not possess any rules for positioning himself in relation to a new subject; or therefore, because the previously relevant rules no longer seem suitable for taking a position.

Negative experiences confront the individual with the task of *searching for orientation*. Against this backdrop chaotic conditions are to be marked as destructive and constructive at the same time. These first of all introduce the possibility of carrying out a "realignment of the relationships to self and the world" (Schäfer 2009, p. 47) and to design alternatives to the until now relevant rules. In this sense Christiane Thompson refers to "*Bildung*" explicitly as "a destructive occurrence that opens up spaces of possibility" (Thompson 2009, p. 47) and in doing so, creates the foundation for becoming a different person.

The design of *new* rules of orientation can be referred to as the *generation* of rules *(Regelgenerierung).* In this case the design takes on the form of a "reflective power of judgment." This "must not only apply existing rules, it must generate new rules for new subjects, and namely those which lay claim to humanity" (Euler 2003, p. 419). Each rule designed by a person is an *experimental structuring* of his own relationship to self and the world, that will be tested in the future interplay with the world and can possibly be relinquished. For the individual, it is and remains unforeseeable whether the rules he designs today will themselves be relevant in the future. For he does not know, whether, and if so, which negative experiences future dealing with the world has in store for him.

New orders of the relationship to self and the world develop not exclusively through the generation of rules, but also through a person's compliance in future action with the rules defined as relevant. With the design of new rules, it does not yet have to be decided

whether a person also follows these rules in his future engagement with the world, and thus not only develops new orders of judgment, but also of action. Most notably, Johann Friedrich Herbart has examined in-depth this complex of problems in his writings. Dealing with the world is capable of "robbing a man of his unity with himself, and setting him at discord with himself," namely, when experiences are "sowing dissension between the subjective and the objective" (Herbart 1806/1908, p. 214). For Herbart, this inevitably leads to a "conflict" (ibid., p. 245). When this occurs, newly developed rules clash with the "features of character" already given. A person has to decide this "struggle" for himself. Only as new rules in future dealing with the world come into use, according to Herbert, new "features of character" can develop. If this succeeds, a person has decided the "struggle" for himself.

Theorists of *Bildung* describe the development, maintenance and change of orders—be they ones of judgment, be they ones of action—as a process open to the future, which is not finalized to an already fixed state. Which rules a person defines for himself are not determined by theorists of *Bildung*, but rather given over to the individual as a task to be accomplished by himself.

For a closer definition of this task "to produce one's own determination" (Benner 1988/1995, p. 152), *Bildung* is described not only as initiated through *experience,* but also as a via *rejection and critique*-conveyed search for new rules of orientation. Negative experiences put in motion a search for orientation in which rules are offered to a person, towards which he can behave either in affirmation, negation or rejection. The concept of *rejection (Rejektion)* refers to the circumstance in which a person rejects rules (temporarily) (see Marotzki 1990 p. 194)—not in order to refuse rules, but to be able to check, whether, and if so, which offering of rules should be accepted or refused. For this test, in turn, there is the concept of *critique (Kritik).* "Critique under the aspect of the theory of *Bildung* (…) aims at not having to follow any truth claim without previous examination" (Ruhloff 2004, p. 386). In critique, positions that raise a claim of validity, are subsequently tested whether, and if so, how actual validity is to be ascribed. A person generates rules accordingly, in consideration of the rules that are offered to him in his search for orientation. These will, however, not be accepted without question by the individual, but examined for their power to convince (see Ballauff 1993, p. 5).

Krassimir Stojanov thus sees *Bildung* situated in a "game of giving and asking for reasons" (see Stojanov 2012, pp. 51ff). With this phrasing, borrowed from Brandom (1994, pp. 496f.), Stojanov, along with others, would like to reveal that the enablement of *Bildung* in the end is only possible as a "discursive initiation" (Stojanov 2012, p. 85) and—in relation to this—presupposes a specific kind of social relation, namely "referring to another person as end-in-itself" (ibid., p. 86), or—in the words of David Bakhurst—"as subjects of a life of their own" (Bakhurst 2011, p. 34).[8]

One may raise concerns over such a description of *Bildung* as "initiation into the space of reasons" (McDowell 1996, p. 125) as an unsatisfactory reductionism that leaves out the "breadth of possibilities for world relationships," and instead vote for a definition of *Bildung* as "self-construction of the subject" in the engagement with the world (Tenorth 2012, p. 405). Yet it is also assumed in this case that the individual in principal has available possibility *to develop beyond acquired positions,* and that each newly developed

[8] Stojanov pursues this thought even further by connecting considerations of the theories of *Bildung* and recognition. This connection leads Stojanov to the differentiation of three forms of recognition: empathy, respect and appreciation, which in his opinion form the foundational social conditions for making *Bildung* possible (Stojanov 2012, pp. 84ff).

position is conveyed via a non-circumventable *self-conduct (Sich-Verhalten)* of the individual, so that *Bildung* is described here also as a process open to the future.

The concepts of negative experience, rejection, critique and design introduce the possibility of more closely defining the in question self-conduct of the individual. During by *negative experiences*, the dynamic of *Bildung*—over and over again—is initiated, rejection and critique prevent, that validity is ascribed to positions without calling them into question. Without rejection and critique *new*-design would merely have the form of *post*-design *pre*-designed rules. Rejection and critique in contrast introduce opportunities to the individual to define rules as relevant for himself and conform to *these* rules in future dealing with the world. In this sense *Bildung* is identified by a twofold dissociation: negative experiences enable a dissociation from one's *own* position. Rejection and critique in contrast enable a dissociation of positions that *others* expect of the individual. This twofold dissociation introduces a *space for self-determination*. It is in this space that the openness of the dynamic of *Bildung* has its place. Due to the space in question, it is not certain beforehand which position a person develops in the process of *Bildung*, but is decided foremost in this process itself. In this way the individual is not bound to choose only among rules that were brought to his attention (*finding of rules*). Rather, he also possesses the possibility of not choosing between given alternatives, but instead of generating alternatives to the rules that are offered to him in his search for orientation (*invention of rules*).

Uncertainty is the price to pay if *Bildung* is described as a process open to the future. The uncertainty of *Bildung* exists in that it is impossible to successfully predict which positions in the interplay of engagement with the world, experience, rejection, critique and design will develop. Not only are educators and educational researchers affected by this uncertainty, but also the self-educating person himself. It is generally impossible to predict how the individual, after of a negative experience, will reposition himself in relation to self and the world. Through negative experiences "exploratory exercises" are introduced that are "finalized not on a known not-yet, but without a fixed place in an unknown" (Benner 2005, p. 10). The generation of rules is situated within a horizon of possibilities and it is uncertain which of these possibilities will be realized by a person. *Bildung*, as Roland Reichenbach puts it, is a process "with unknown outcomes" (Reichenbach 2002/2003, p. 95)—not, because *Bildung* ceases or fails, but precisely because it succeeds (see Blankertz 1969/2000, pp. 41f.; see Meinberg 2010).

That such a circumstance has consequences for the predictability and controllability of *Bildung* ought to be apparent. Correspondingly, *Bildung* is described in the perspective of *Bildungstheorie* as an interplay between dealing with the world and reflection, that provides each planning with the index of uncertainty, and that through pedagogical action at best can be supported, though never can be effected. *Bildung* is instead described as something "that eludes planning and conscious intervention" (Flitner 1950/1997, p. 69; see Höltershinken 2013).

The concept of *planning problems* refers to the fact that *Bildung* cannot be appropriated for planning, for it is not suitable for lending security to planning. *Bildung* instead brings uncertainty into planning and for this reason hinders its success. In many cases of planning, a specific orientation of people must be taken into account. Since however the dynamic of *Bildung* is open to the future, every anticipated rule of orientation is provided with the index of uncertainty. In cases of *Bildung*, there exists namely the possibility that a person defines other rules as relevant for himself in the interplay of dealing with the world, experience, rejection, critique and design, as is anticipated in planning.

Bildung is recognized as complex, which means, for example, that the planning of lessons can not only thus be impeded, that learning processes have *not* yet occurred. One should perhaps consider that in this situation the students do not have at their disposal the knowledge, ability and skills necessary to successfully implement a planned instruction unit. Planning problems result, in contrast to this, not out of *failed*, but out of *successful* processes of *Bildung*. *Because* processes of *Bildung* have occurred, the implementation, for example, of a planned instruction unit takes a different course then assessed in the planning. Here one must only think of situations in which students devise a new solution for a mathematical problem, evaluate a literary topic in their own way, meet the political view of a person with resistance, or simply pose questions, that the teacher had not considered in preparation for a teaching unit.

The *governance problems* of *Bildung* are to be distinguished from planning problems. A first important differentiation worth considering in defining this aspect of *Bildung's* complexity is described by Marian Heitger. The latter speaks of a "powerlessness" in pedagogical action that "can neither effect" the processes of *Bildung* "nor determine its enforcement" (Heitger 1989/2004, p. 31; see Herzog 2008, p. 22). Consequently, it is for an educator *neither* controllable, that an interplay of dealing with the world and reflection sets in at all, *nor* which positions in the interplay of reflection and engagement with the world develop, maintain and are changed. Both aspects of governance problems affect meanwhile not only the teacher but also the self-educating person (himself). Neither of the two holds sway over whether dealing with the world leads to an experience, and if so, to which one. However, the design of the individuals remains deprived of control through a teacher. For this reason, each attempt to influence the designs of a person, in order to provoke the design of specific rules, can lead to this being adopted without one's own judgement, and *Bildung* is encumbered or even prevented.

Bildung can only be enabled in this sense, and to produce a description of education as "enablement of Bildung" (Girmes 1997, p. 92) would be worthy of its own article.[9] That such an education must also be described as complex, is to be assumed (see Anhalt 2012). Gert Biesta explicitly highlights this fact in *The Beautiful Risk of Education*, when he speaks of the "openness and unpredictability of education" (Biesta 2013b, p. 140). In this sense education is concerned with a risky undertaking—at least in any case, if education is not reduced to the tasks of "qualification" and "socialization," but also takes into account that task which Biesta identifies as "subjectification," "which has to do with the interest of education in the subjectivity or 'subject-ness' of those we educate" (ibid., p. 4). In what is the risk founded, that children and adolescents determine other positions for themselves, as those expected by the adult generation? "The risk is there because students are not to be seen as objects to be molded and disciplined, but as subjects of action and responsibility" (ibid., p. 1). This is precisely the reason why Biesta does not describe the risk of education as a *problem*, for which solutions have to be found, in order to make "education strong, secure, predictable, and risk-free" (ibid., p. 2), but rather speaks of a *beautiful* risk of education.

[9] This is the point where one is confronted with "one of the greatest Problems in education": "How shall I cultivate freedom under conditions of compulsion?" (Kant 1803/1904, p. 131). However, this challenge is not infrequently solved in a one-sided manner. See also Pikkarainen 2012, p. 21: "The division of educational questions and theory in the continental way, between *Bildung* theory and *Erziehung* theory can be seen based just on that pedagogical paradox".

Conclusion: On the Benefit of Discussing *Bildung* in the Horizon of Complexity

As we attempted to demonstrate, theorists of *Bildung* and theorists of complexity examine a *structural analogue problem,* namely the description of an open, uncertain, and consequently with planning as well as governance problems-afflicted interplay of components. This insight offers from our point of view at least two benefits:

On the one hand, it is now possible to introduce a systematic in the loosely connected group of authors with the name of *Bildungstheorie*, by which attention is brought to the common foundations of various descriptions of *Bildung*. This seems to be an important contribution to the clarification of educational-scientific theory construction. Only a clarification of commonly shared presuppositions of *Bildungstheorie* should make it possible to discuss differences between descriptions of *Bildung* as well as to explore any advances, stagnations or even regressions in knowledge in a methodically controlled way. How, one might ask, is the openness of *Bildung* conceived in different theories of *Bildung*? How is the emergence of relationships to self and world explained? Do theories of Bildung develop convincing descriptions of the transitions between different phases of the process of *Bildung*? Are these phases considered at all or are only some phases involved in the considerations of an author? Do theories of *Bildung* provide convincing answers to the question of how to deal with planning and governance problems associated with the openness and uncertainty of *Bildung*?

The last question raises the problem of connecting *Bildung* with education. In theories of *Bildung* education is traditionally linked to the task of enabling *Bildung* (see Benner 2010, pp. 150ff). As our analysis shows, such an education systematically creates uncertainty as well as planning and governance problems that will not make education easier. Therefore, the question is not least why education should at all be linked to the task of enabling *Bildung*. To put it plainly: What reasons are developed in theories of *Bildung* to justify their definition of *Bildung* as complex, and how these reasons are to be assessed?

On the other hand, the correlation of "*Bildung*" and "complexity" opens up the view, that the formulation and development of complex problems in educational science can already draw on substantial material. This ought to be another important step on the way to an educational-scientific complexity research participating in the inter- and transdisciplinary areas of complexity study (see Rucker and Anhalt 2017). The ambition outlined at the beginning of this article of developing an educational-scientific complexity research should therefore be connected with the interest of clarifying already existing knowledge about complexity within the tradition of educational-scientific theory construction.

In this way, it should be possible to ensure that in current efforts of describing *Bildung* and education from a complexity-theoretical perspective an already achieved awareness of problems *(Problembewusstsein)* is not undershot. In the tradition of *Bildungstheorie* there is, according to our thesis, a rich fund of knowledge about *Bildung* and education, which should gain relevance in the course of the 'complexity turn'. One might think, for instance, of the question, which tasks of education are adequate to the complexity of modern democratic societies (see Ruhloff 1996, p. 152; Reichenbach 2002/2003). In this connection, theories of *Bildung* seem to be connectable to current considerations in educational theory. In order to mention at least one example, *Bildung* moves close to the task of education, which Gert Biesta calls 'subjectification' and describes it as supplementary of the educational tasks of 'qualification' and 'socialization' (see Biesta 2013b, p. 4). In so far as theorists of *Bildung* describe *Bildung* itself as complex, they point out that education,

which is not reduced to the tasks of 'qualification' and 'socialization', is opposed to ambitions of governance. Against this background, not only the "language of complexity" should make it possible „to see the non-linear, unpredictable and generative character of educational processes and practices" (Biesta and Olberg 2010, p. 2). This is also true for our knowledge in the form of theories of *Bildung*. Currently, this knowledge should be of great importance, as especially today „the hope of bringing education closer to the point of alleged perfection" proves to be virulent (ibid.; see Biesta 2007).

Of course this knowledge makes an educational-scientific complexity research in no way redundant. This is alone demonstrated by the fact that theories of *Bildung* do not operate with a clarified concept of complexity, and thus the perception, that *Bildungstheorie* is fundamentally characterized by thinking in complexity, presupposes the perspective of complexity theory. Yet if theories of *Bildung* aren't in the position to replace an educational-scientific complexity research, they do already hold substantial material available for its further development. The compatibility of educational science to the transdisciplinary developments in the field of complexity research ought not be threatened, if it should succeed in orientating itself in a transdisciplinary way, as well as in eliciting the already available knowledge about complexity. However, educational science could thus be described as a modern science that complies with the prevailing status of knowledge in complexity research, without surrendering its own theoretical traditions.

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