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Psychology Department

Measuring Character Change in Neuroscience

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Case report



Fig. 1 Representative painting by the patient before deep brain stimulation showing the old pavilion of the Department of Neurology in Kiel (built in 1901), the working place of Hans-Georg Creutzfeldt 1938–1953

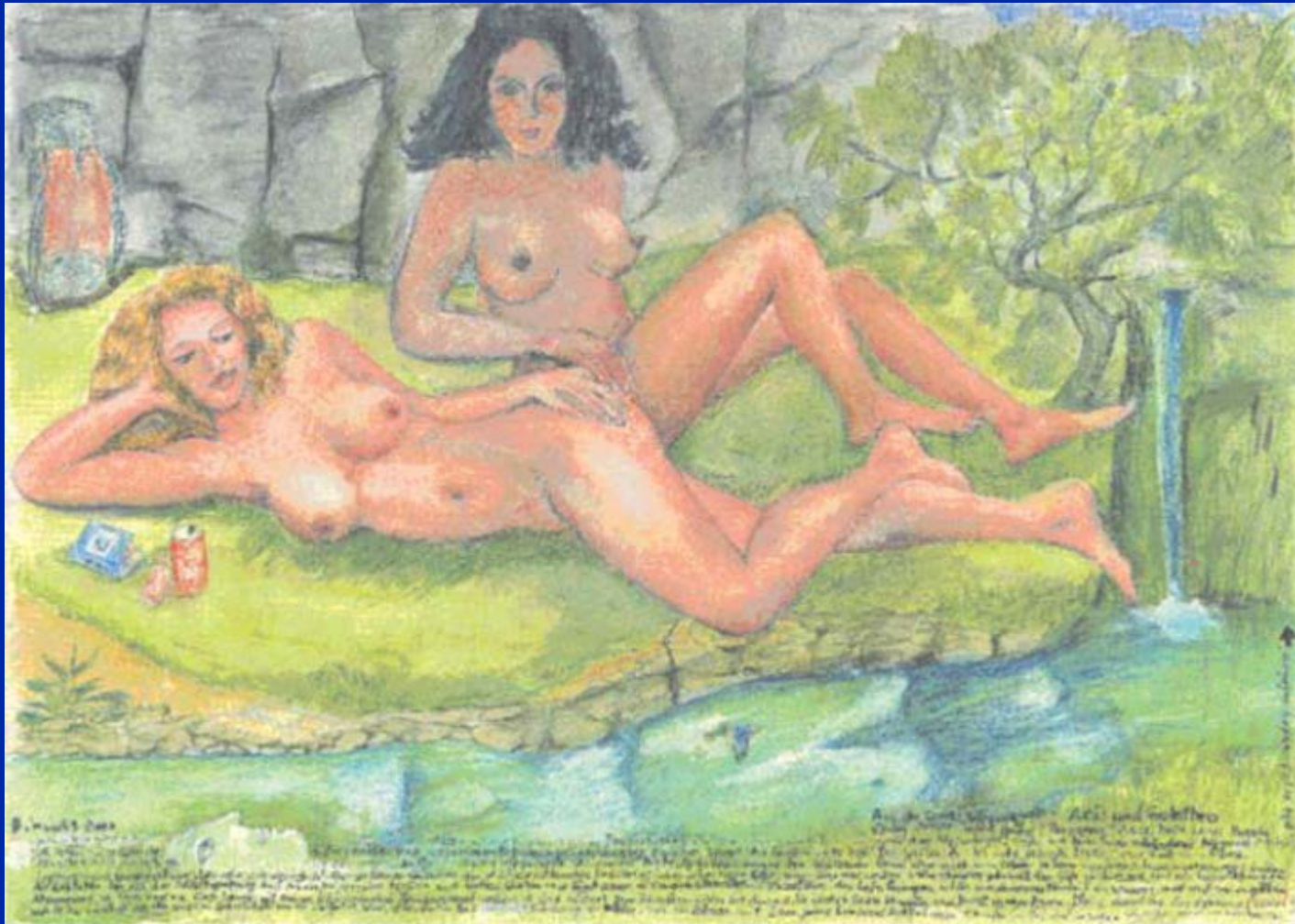


Fig.2 Painting by the patient after implantation of electrodes for deep brain stimulation displayed on the wardround. He labelled this painting 'the search for perfection'. Note the comments written at the bottom of the painting which are logorrhoeic and optimistic



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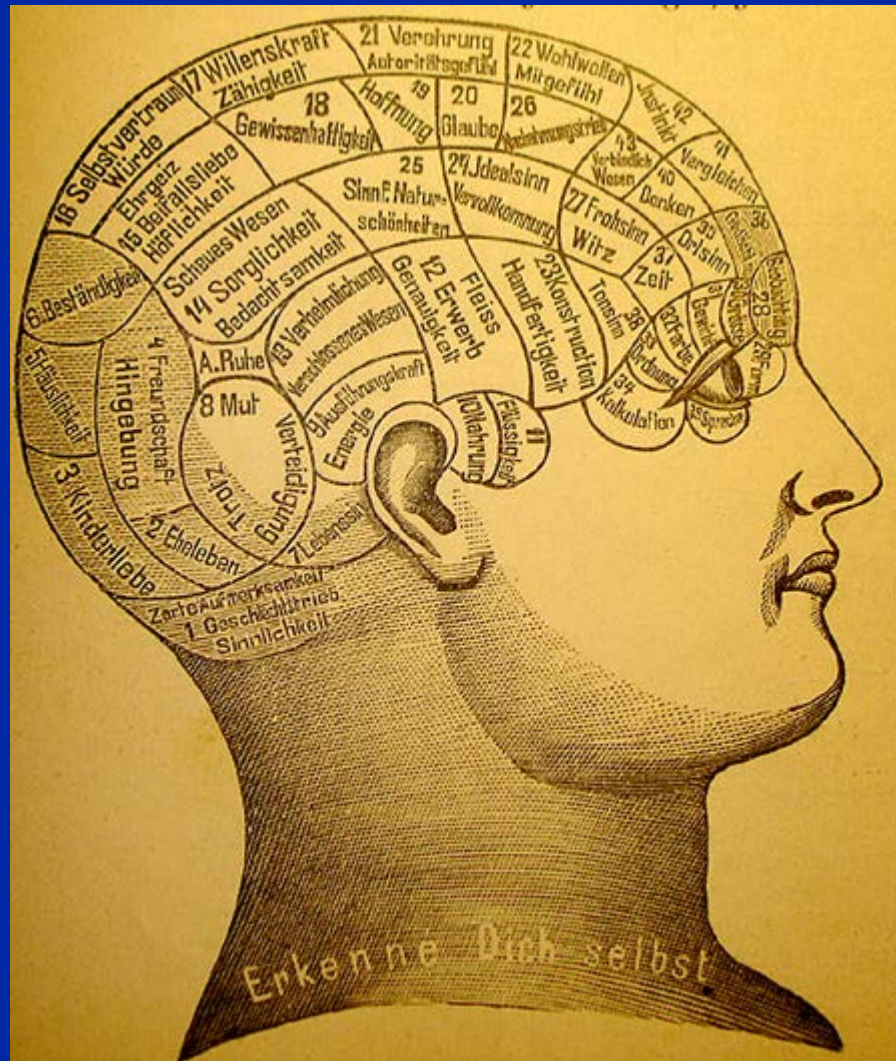
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Historical note

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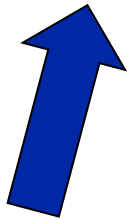


Friedrich Eduard Bilz (1842–1922):
Das neue Naturheilverfahren



An exemplary case: Leonore Welt:

Ueber Charakterveränderungen des Menschen infolge von
Läsionen des Stirnhirns.



Aus der medicinischen Klinik in Zürich.

Von

Leonore Welt,
prakt. Arzt in Genf.

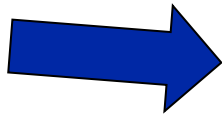
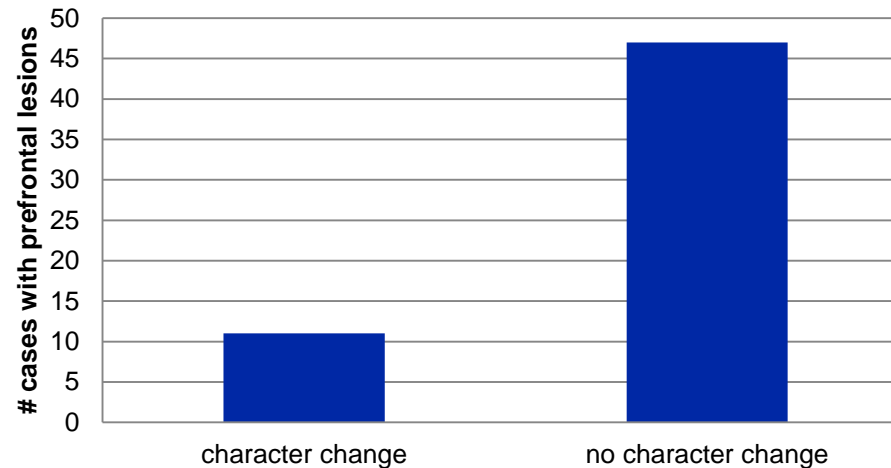


Image: Deutscher Lyzeum-Club,
1929 (Brinkschulte 1993)



Cases described by Welt (1888)



Es ist schon im Vorhergehenden oft gezeigt worden, dass Läsionen dieser Theile keineswegs immer, ja wie man aus der geringen Zahl der hier gesammelten Beobachtungen sehen kann, sogar sehr selten zu Charakterveränderungen führen. Schon die auf S. 358 an-

As it has been shown before, lesions of this part of the brain [prefrontal cortex] do not always lead to character changes; actually, as the small number of observations demonstrate, they lead very rarely to such changes.

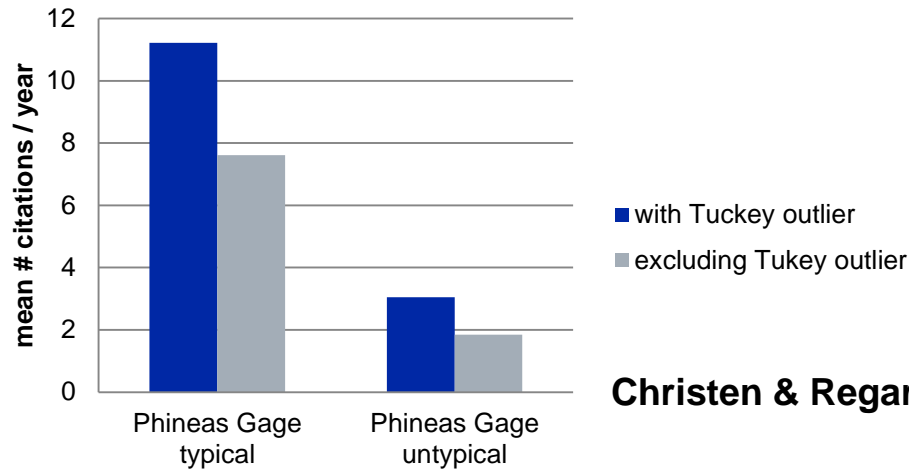


Jedenfalls wird man rücksichtlich der diagnostischen Verwerthung der in Rede stehenden Veränderungen bis jetzt kaum weiter zu gehen wagen dürfen, als dass, wenn derartige Störungen vorhanden sind, eine Läsion des der Medianlinie naheliegenden Theiles der orbitalen Fläche des Stirnhirns besteht, vorausgesetzt, dass man sich dessen bewusst ist, dass man den diagnostischen Schluss nicht umkehren dürfe und sagt, dass jene Stelle intact sein müsse, wenn solche Veränderungen nicht vorhanden sind.

With respect to the diagnostic values of character changes we may conclude that, if such changes are present, we can expect a lesion of the ventromedial prefrontal cortex; but one must be aware of the fact that one cannot invert this conclusion, i.e. one cannot say that there are no vmPFC lesions present when we do not observe a character change.



Citation gap in lesion literature



Christen & Regard 2012

There are two problems of current work with lesion patients: First, recent studies using patients with frontal lobe lesions in moral research promote a neurodeterminism of human moral behavior, which is insufficiently supported by the current state of knowledge. Second, there is a shift in research away from clinical issues towards basic research on human morality (Christen & Regard 2012).



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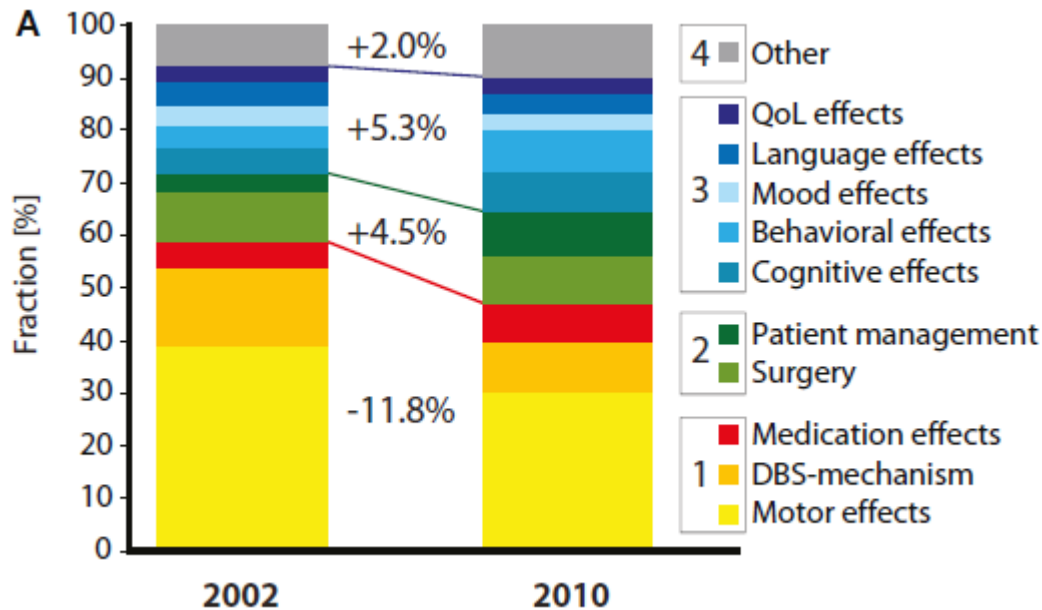
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Measuring “character”



Non-intended effects of DBS: was there a *lack of sensibility* among researchers/clinicians?

No!

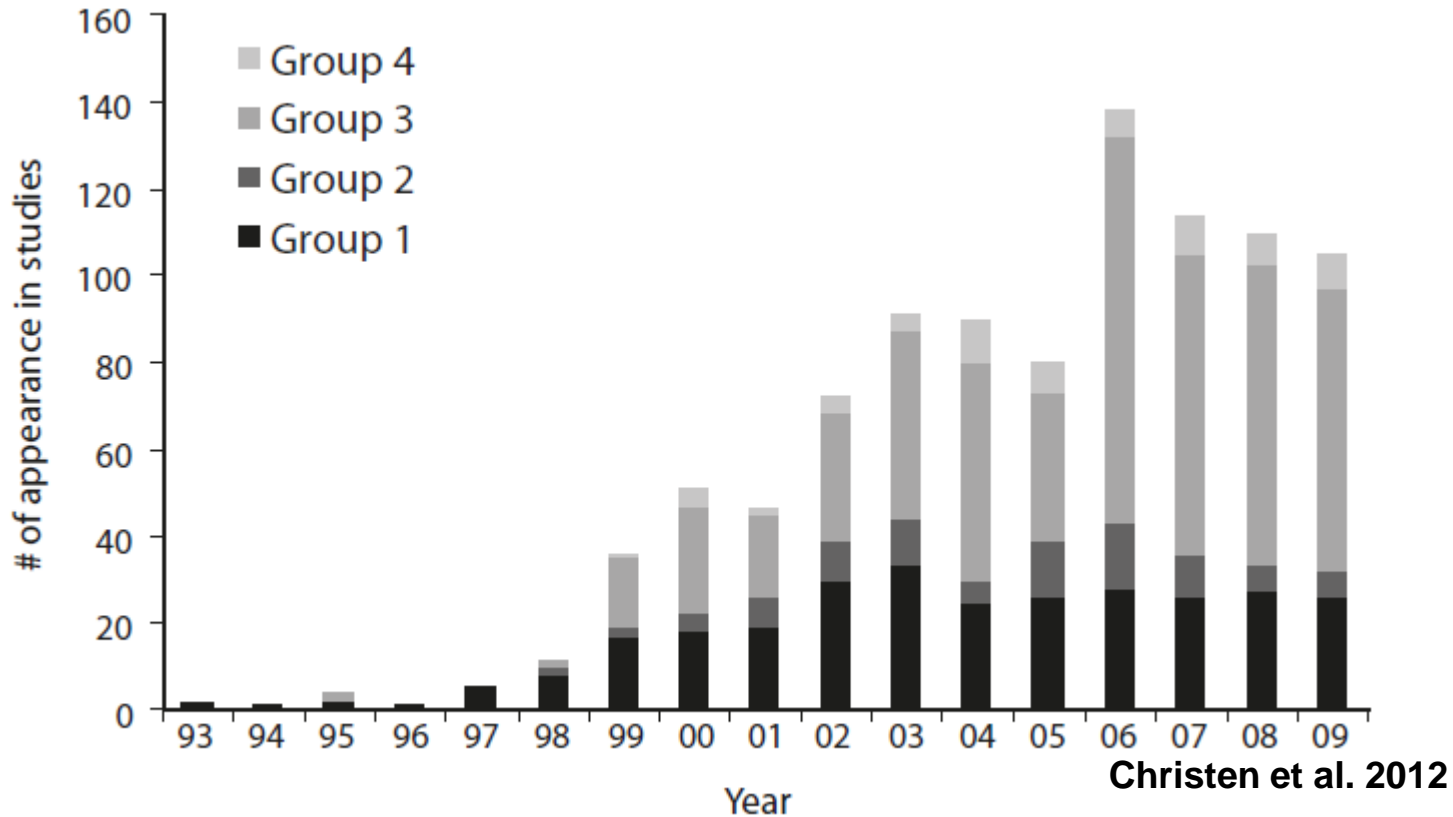


Christen & Müller 2011



Non-intended effects of DBS: was there *not enough sensibility* among researchers/clinicians?

No!





Non-intended effects of DBS: Did the researchers/clinicians take into account the complexity of the phenomenon “character”?

Maybe not!

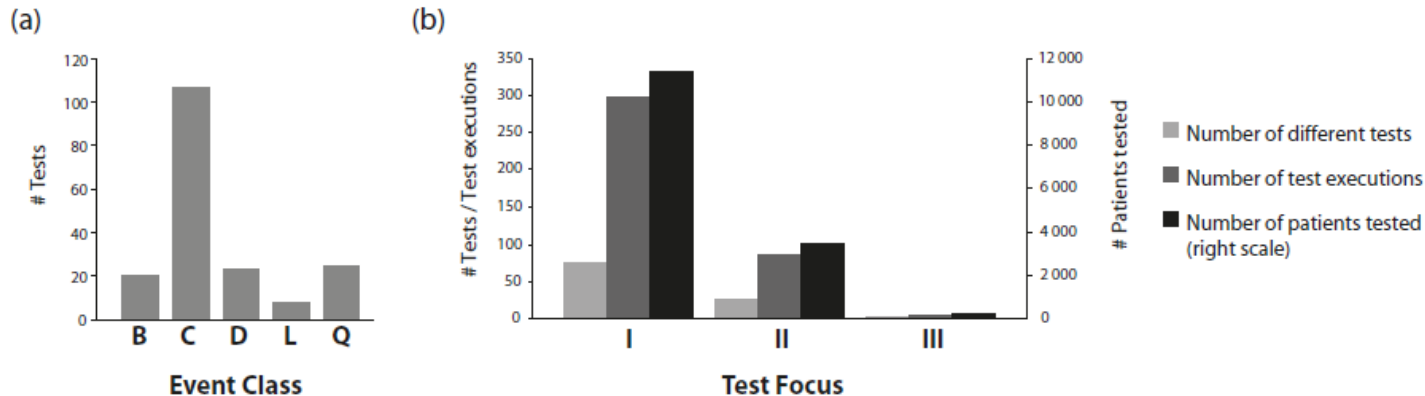


Figure 3. (a) Number of tests per issue class (B: behavioral, C: cognitive, D: depression and other mood issues, L: language, Q: quality of life). (b) Number of different tests (first bar in each group), number of accumulated test executions (middle bar), and total number of patients tested (left bar, right scale) with methods of either class I (test scores generated by evaluator), II (self-assessment of patient), or III (test scores emerge from persons affiliated to the patient).

Christen et al. 2012



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The ethics of character change

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The landscape of “ethical difficulty”

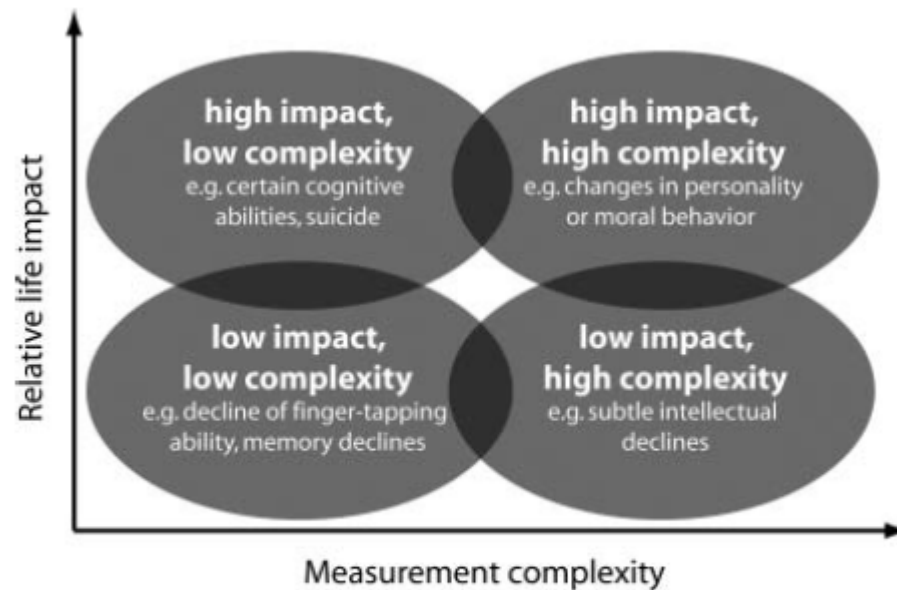


Figure 2. Classification of side effects of STN DBS along the dimensions “measurement complexity” and “relative life impact”; highlighted are four clusters of side effects.

Müller & Christen 2011



Some ethical recommendations

Table 1. Ethical requirements depending on the predictability and the evaluation of the side effects of a therapy

Evaluation	Predictability of side effects (SE) of a therapy	
	Predictable	Not predictable
The SE of the therapy clearly outweigh its therapeutic effects.	Do not begin/stop the therapy.	Ensure sensibility for novel SE.
There are conflicting evaluations of the SE by different stakeholders.	Define the authority to decide about the usage of the therapy.	Ensure involvement of different stakeholder's perspectives during the development of the therapy.
The therapeutic effects clearly outbalance the SE.	Define a procedure to take individual variability of the impact of the SE into account.	Define a procedure to decide whether a novel SE is classified as unproblematic or not.

Christen et al. 2012

Enhance the ability of the “patient-system” to get an own understanding of character and of character change in order to allow to reflect upon such effects (as far as this is possible).