

# Agency, autonomy and consent: cues from the neuroscience of self-control

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## 1. *Informed consent: an issue for neuroethics*

Since its beginning, the neuroethical debate has recognized informed consent as a crucial notion about which to interrogate neurocognitive sciences for more empirically-driven reformulations in (bio) ethics<sup>1</sup>.

The importance of informed consent in medical practice and research is such that nowadays its lack is universally recognized to be one of the worst forms of negligence, malpractice or tort by healthcare professionals. With the goals of protecting the patients from harm, paternalistic judgments, or external interests, informed consent is considered an essential requirement for prevention of the patient's personal autonomy against dominance and abusive conduct<sup>2</sup>. However, informed consent is a protection for medical doctors as well<sup>3</sup>, as it is their own interest to disclose enough about the risks and benefits of proposed treatments to improve prognoses and to insure fiduciary responsibilities, also in order to avoid future legal action.

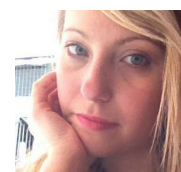
Both pivotal and critical principle in medical ethics and research ethics, informed consent is tied to philosophical views about moral agency and autonomy, and it is an intrinsically interdisciplinary notion<sup>4</sup>. In fact, the voluntary choice to give consent to medical treatment or to participate in a research study requires a present state of individual autonomy, or a series of conditions according to which the patient's decisions are thought to be "her own". This implies both the patient's *capacity* of self-government (i.e. moral

agency) and the *right* to be free to exercise such self-government (i.e. legal autonomy). These notions are and should be derived by empirical descriptions and normative formulations in other fields beyond moral philosophy, from cognitive neurosciences to law.

In this paper I intend to focus on common alterations and distortions to an informed, voluntary, and decisionally-capacitated consent in the medical setting, especially those that impact the patient's decision-making process. In doing so, I will focus on two specific issues. On the one hand, I will examine cognitive biases and self-deceptive processes that may affect the patient's choice and autonomy<sup>5</sup>. On the other hand, I will discuss the capacity of self-government as what usually referred to as the neurocognitive capacity of self-control<sup>6</sup>. My view thus consists of two main claims: that even in capacitated individuals, consent to treatment/research is not necessarily identifiable as fully rational and deliberative choice; however, that empirical literature about self-control may shed some light on how to improve informed consent procedures as such.

## 2. *Cognitive biases, heuristics and consent*

There is much evidence in neurocognitive sciences demonstrating that full deliberation in medical decision-making, especially in the context of treatment/research consent, is rather impossible. This is a tricky question, particularly if we consider that deliberation incorporates the sub-elements or conditions



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of a capacitated and autonomous consent: (i) understanding and appreciation, (ii) intentionality, and (iii) absence of controlling and/or alienating influence<sup>7</sup>.

Effective reasoning would require not only access to all relevant information, grasp of the full meaning of given data (including statistical and medical knowledge), and sufficient time to weigh possible options but, most importantly, a series of neurocognitive resources to maximize the best predicted outcome (or subjective utility), which humans in general have been shown to lack.

As longstanding research on cognitive biases and heuristics have evidenced<sup>8</sup>, factors we are unaware of influence and deviate our decisions in different uncontrollable ways.

A distinction that must be kept in mind in this context is the distinction between *bias* and *deficit*<sup>9</sup>. While the former is the systematic tendency to privilege some forms of information in capacitated individuals to respond to some unconscious or automatic desires or preferences, the latter is an extended incapacity to perform a cognitive function. Therefore, I am not referring here to cognitively impaired individuals, whose competence to give informed consent is assessed clinically (for example through the MacArthur Competency Assessment Tool for Clinical Research MacCAT-CR<sup>10</sup>), so to define if they might require a surrogate decision-maker.

Some recent overviews<sup>11</sup> suggested a tentative list of the predictable and systematic deviations from standard norms of rationality, or *biases*, which may affect the competent patient's autonomous judgment in the medical setting. This list of the most prevalent cognitive biases and heuristics in medical decision-making (19 in total) was obtained from more than 5.000 peer-reviewed empirical studies found in medical databases in a range of three decades (1980-2013)<sup>12</sup>. The list includes the following: affect heuristic, ambiguity aversion, anchoring bias, availability bias, bandwagon effect, commission bias, confirmation bias, decoy effect, default bias or status quo bias, frequency/percentage framing effect, impact bias, loss/gain framing bias or loss aversion bias, omission bias,

optimism bias or optimistic overconfidence, ordering effects or recency/primacy bias, outcome bias, relative risk bias, representativeness heuristic, and sunk-cost bias.

An interesting limit evidenced by this study is that most of the experiments on biases and heuristics in the medical context are based on hypothetical vignettes, and very few on actual decisions involving medical personnel and real patients.

Nevertheless, there is a growing interest on how these well-known fallacies impact physician-patient communication and informed consent, specifically on how they limit or undermine the components of autonomous agency<sup>13</sup>. It is reported of heart failure patients who consented to be implanted with a left ventricular assist device, despite the fact that they were informed that only 16% of them would receive a heart transplant and that this was only an end therapy (i.e., optimistic bias)<sup>14</sup>. Another example is that of healthy people overestimating the impact of dialysis on happiness compared to actual dialysis patients, showing to have distorted the consequences of dialysis on the person's quality of life (i.e., impact bias)<sup>15</sup>. These people were clearly missing condition 1, that is, understanding and appreciation of relevant information.

Condition 2 - i.e., intentionality - requires the agent to do things on purpose, and not by accident, habit, or force. In a private conversation, I heard about a pregnant woman who refused epidural anesthesia during labor, contrarily to what she had previously planned, just because at the very moment an obstetrician told her that in her favorable delivery conditions other people would not ask for it (i.e., bandwagon effect). She reported to feel conflicted between her own intention and her actual decision.

Furthermore, when patients decide in favor of a treatment after being told that 90% is the survival rate, but they decide against it when being told that the mortality rate was 10% (i.e., availability bias, framing bias)<sup>16</sup>, their consent is not meeting condition 3 (i.e., absence of controlling or alienating influence).

By drawing attention to the humans' inability to restrain the impact of lower-order desires and preferences in most situations, such research on biases and heuristics questions theories that conceive autonomy as the matching between the individual's actual choices with her higher-order desires and preferences<sup>17</sup>. An example is that of a patient who has the second-order desire of being cured or relieved by the pain she is experiencing, but that has a first-order preference of not having her body manipulated by healthcare professionals. Such patient might fall more easily into unconscious irrationalities and reject a beneficial treatment.

Moreover, in doing so, such studies may challenge both the validity and the moral status of the notion of consent in itself. If we endorse the general assumption that only the individual's conscious deliberation determines voluntary decisions and ethically protected action, an issue to be addressed

is that consent obtained under different circumstances appears to be an invalid (or inadequate) and unethical (or illegitimate) requirement.

### *3. Some cues from the neuroscience of self-control*

If we endorse the inalienability of the right of informed consent in the medical context but we wish to take into account the consequences of the findings about heuristics and biases, it seems that conceiving capacitated consent as determined by conscious deliberation might be a too strong requirement for this principle.

In this section, I will argue that empirical research may provide healthcare professionals cues on how to limit their patients' reasoning errors. To this purpose, I believe it is worthy to examine the research about the neuroscience of self-control.

Accordingly, to exercise morally effective autonomy an individual must have a certain degree of control over her decisions and actions, where degrees of control determine also her degree of responsibility for them<sup>18</sup>.

Therefore, brain areas of self-control, the effortful capacity to regulate one's automatic thoughts, feelings and behavior in favor of long-term interests or goals (so-called *delay of gratification*,<sup>19</sup> may be considered the neurocognitive underpinnings of autonomy<sup>20</sup>.

These consist of a distributed, integrated network of brain structures: the reward or limbic system for emotions (e.g., vmPFC, ventral and dorsal striatum - caudate nucleus); frontal areas of reasoning (e.g., lateral PFC, dorsolateral PFC, lateral orbitofrontal PFC, dorsal ACC); areas involved in social cognition (e.g., mPFC, especially dmPFC, TPJ including STS, amygdala)<sup>21</sup>.

The kind of choices that require self-control are made when we have con-

flicting preferences, only a few calculable probabilities that the event will occur are known, or the chances of obtaining gratification are unknown or not calculable. Failures of self-control, like for example choosing impulsively or yielding to harmful temptations, may be determined by reasoning biases. A very common bias is, for example, intertemporal discounting, according to which we tend to reduce reward values as delay increases<sup>22</sup>. Very frequently, however, the agent reports to know the most rational and convenient decision, but still fails to take it. This might be a case in which the agent shows a self-deceptive capacity in attributing her own's desires and intentions to herself<sup>23</sup>.

As an approach to bias mitigation, literature on self-control shows that it is worthy to focus on affect and incentives. I will not consider rational debiasing trainings, as they are not suitable for medical decisions because they may take too long and require a high level of education from the patient. Neither

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are nudges to the option the physician believes best, because this appears to be incompatible with autonomous consent.

First of all, research has shown that self-control does not imply additional willpower. Reframing dilemmas in more explicit formats is considered a good strategy to enhance self-control and reduce discounting bias. However, areas correlated to deliberation or willpower (i.e., DLPFC) show no different activation in explicit (“Would you prefer [A] \$5 today OR [B] \$10 in a month?”) and implicit formats (“Would you prefer [A] \$5 today and \$0 in a month OR [B] \$0 today and \$10 in a month?”)<sup>24</sup>.

People who are low gratification delayers have exaggeratedly increased recruitment of ventral striatum, a “heating” emotional system<sup>25</sup>. Nevertheless, more than resisting to “hot” stimuli through top-down strategies, individuals who are very skilled in delaying gratification are able to cooling temptations<sup>26</sup>, for example by “converting the aversive waiting situation into a more pleasant and non-waiting one”<sup>27</sup>.

Positive emotions in general, including those elicited by incentives and reinforces, favor cognitive flexibility, attention, learning and memory. They seem to impact beneficially on comprehension and voluntariness. People in positive affect, for example, are more likely to risk<sup>28</sup>, less subjected to the discounting bias<sup>29</sup>, and more prone to engage repeatedly in beneficial tedious activities<sup>30</sup>, even if they show to be particularly sensitive to significant losses<sup>31</sup>.

The influence of negative emotions has been largely studied as well. An example is the effect of fear on vaccination choices<sup>32</sup>. It must be mentioned, however, that the more individuals are prone to time discounting, the more they tend to be myopic to the negative valence of the risks they might face with their choices<sup>33</sup>.

Contextual effects also improve self-control performance in decision-makers. Some examples are reliable environments, where people keep promises<sup>34</sup>, there is high level of experienced trust<sup>35</sup>, and social cooperation<sup>36</sup>. Another strategy is relatedness or social

bonding. Self-control abilities increase for the only effect of a friendly physical contact by a stranger before the task<sup>37</sup>.

These are all strategies healthcare professionals could use to foster their patients’ autonomous choices.

An issue to be considered, however, is that responsibility for decisions and actions has been usually linked to conscious control. If self-control competency can be enhanced and exerted unconsciously, but still we wish to preserve the notion of responsibility, we need to find some criteria to define when we are accountable for our unconscious choices<sup>38</sup> (with reference to the negative sense of responsibility).

Elsewhere, I defended the idea that there are occasions where unconscious voluntary choice may be expression of our true selves and it may reflect the demands for being accountable of our actions<sup>39</sup>. This is a global traits account<sup>40</sup>, according to which the agent’s reason for acting does not need to be present at her consciousness at the time of acting but it is temporally stable and regularly manifested in her global functioning across different situations from a third-person perspective. This view aligns with a concept of autonomy as consistency with past decisions<sup>41</sup> but it also preserves the libertarian idea that autonomy consists of freedom to have one’s will respected, with the only difference that will is not necessarily detected at the conscious level.

#### *Concluding remarks*

Given all the above, we are able to instruct healthcare professionals with some strategies for improving the informed consent process and the competent patient’s autonomy. These include positive incentives and contextual interventions (such as reliability, trust, cooperation and social bonding).

There have been ethical objections to this affective approach to informed consent as thought to induce therapeutically unrealistic expectations and to be potentially manipulative<sup>42</sup>. However, we should consider that ra-



tional strategies are hardly resistant to these objections, which seem to affect any kind of interventions.

Optimistic bias is particularly interesting in the medical context as it is debated whether optimistic cognitions, although unrealistic, are psychologically adaptive and conducive to the patient's psychological wellbeing<sup>43</sup>. Nonetheless, it must be noted that we can have positive states but still have realistic beliefs, as they are not necessarily tied together. This seems to have beneficial implications in ethical conduct<sup>44</sup>.

Moreover, it is a physicians' moral obligation to present all relevant information realistically. It is also their obligation to be acquainted with emotional influences on decision-making processes also in order to limit unintentional manipulations (given that they should not engage in intentional manipulations, like for example undue persuasion or coercion).

#### NOTES

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