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Target Article

What Patients With Behavioral-Variant Frontotemporal Dementia Can Teach Us About Moral Responsibility

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Moral and legal responsibility is diminished in neuropsychiatric patients who lack the capacity to use reasoning to determine morally appropriate behavior. Patients with behavioral-variant frontotemporal dementia (bvFTD), however, develop immoral behaviors as a result of their disease despite the ability to explicitly state that their behavior is wrong. In order to determine whether bvFTD patients should be held responsible for their immoral behavior, we begin by discussing the philosophical concepts of free will, determinism, and responsibility. Those who believe in both determinism and free will are called compatibilists. We argue that reason-responsiveness, a specific type of compatibilism, cannot fully determine responsibility in bvFTD patients if reason-responsiveness is considered to be a single, unified concept. Instead, we argue that several different neuropsychological capacities, including many that are impaired in bvFTD patients, contribute to a patient's ability to respond to certain reasons in specific situations. Finally, we propose a new framework for understanding reason-responsiveness, using case examples to illustrate how this model can be used to determine responsibility in neuropsychiatric patients.

Keywords: free will, frontotemporal dementia, morality, responsibility

While there is no consensus on how to determine responsibility, for the sake of this article, let us assume a common definition: that responsibility depends on our thoughts, desires, and intentions being freely willed (Harris 2012). According to this definition, because our will is causal in decision making, when our decisions affect other persons, we are morally responsible for these outcomes. Legal systems have evolved using this sense of moral responsibility as the basis for legal responsibility (Wasserman and Johnston 2014). In certain situations, individuals are absolved from legal and moral responsibility due to severe cognitive deficits that limit the degree to which immoral behavior is freely willed. The most common criteria for criminal insanity, for example, requires that a patient's deficits significantly impair their general capacity for reasoning or result in an inability to understand that their actions were morally wrong (Bucknill 1881; M'Naghten's Case 1843). This is based on the long-standing philosophical and legal assumption that the prerequisite for normal moral behavior, the defining feature of free will, and the basis of our concept of responsibility is the capacity for reasoning (Morse 2004).

Recent advances in the neuropsychological understanding of moral decision making question this long-held view. Experiments in moral psychology have shown that many of our normal moral judgments rely on a number of different processes, including those important for reward and punishment, for feeling intuitions about appropriate social behavior, for experiencing emotions in ourselves and interpreting emotions in others, and for understanding the intentions and beliefs of other persons (Young and Dungan 2012; Young and Koenigs 2007). This raises important questions about the appropriateness of using one set capacity (moral reasoning) to determine legal and moral responsibility, and whether such definitions should be modified as our understanding of the psychology of decision making evolves.

This debate is pertinent to neurological patients, where focal and diffuse injuries to the nervous system can cause impairments in psychological capacities critical for normal moral behavior. Behavioral variant frontotemporal dementia (bvFTD), for example, is a pathologically heterogeneous neurodegenerative disease affecting the frontal and temporal lobes that results in progressive deficits in empathy, apathy,

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compulsive and stereotypic behaviors, excessive eating of sweet foods, and executive dysfunction (Rascovsky et al. 2011). Early in the disease course, patients can present with bizarre and socially inappropriate behaviors leading to legal and moral transgressions in the absence of significant impairment in memory, reasoning, or social knowledge, often leading to misdiagnosis as a primary psychiatric disease (Ducharme et al. 2015). It is estimated that between 37 and 57% of bvFTD patients have committed a crime or acted immorally (Diehl-Schmid et al. 2013; Liljegren et al. 2015; Mendez et al. 2005; Miller et al. 1997), including up to 14% as the reason for initial presentation (Liljegren et al. 2015). There are many individual case reports of patients with bvFTD committing acts of pedophilia, public masturbation, Internet pornography addiction, physical assault, hit and runs, other traffic violations, and theft.

Mendez et al. (2005) reported 57% of patients with bvFTD had committed an illegal act since disease onset, compared with only 7% of patients with probable Alzheimer's disease. The sociopathic acts included physical assault, sexual misconduct/paraphilia, theft, and social norm violations such as public nudity. In a structured interview that followed, each patient described knowing that his or her actions were morally wrong and described in detail the potential negative consequences of these actions. However, 12/16 patients did not feel concerned about these consequences. bvFTD patients therefore commonly act immorally as a result of their disease despite retained knowledge that their behavior is morally wrong. Clinicians, families, and the legal system are faced with the challenging question of determining moral and legal responsibility in these patients.

In this article, bvFTD patients are used as a lens to examine the limitations of using a single psychological capacity to determine moral responsibility. First, we outline the philosophical concepts of free will and responsibility, with a particular focus on compatibilism, where free will is accepted to be true even if the mind and the will are reducible to and determined by neural events (Glannon 2011). We argue that both negative compatibilism and positive compatibilism are inadequate for determining responsibility in neuropsychiatric patients. Next, we argue that an alternative compatibilist framework, reason-responsiveness (Fischer and Ravizza 2000; Fischer 2006), better reflects psychological and neurological patient data regarding moral decision making and is therefore a more appropriate system for determining responsibility. However, our inability to determine the neural correlates of reason-responsiveness in bvFTD patients demonstrates that no single neuropsychological capacity fully determines moral behavior (Rosebloom, Schmahmann, and Price 2012).

Instead, we hope to demonstrate the diversity of mental processes that are required for normal moral behavior. This creates a problem because if multiple mental processes are required for normal moral behavior, determining moral responsibility in an individual neuropsychiatric patient becomes enormously complex. We therefore propose a simplified system for how one might evaluate

impaired mental capacities in multiple cognitive domains, which we call a "constructionist framework." This framework is intended to provide a general approach for evaluating the relationship between dysfunction in a broad range of mental processes and moral responsibility. Finally, using a series of hypothetical cases, we show how the constructionist framework can be applied to determining responsibility in FTD patients.

FREE WILL, DETERMINISM, AND COMPATIBILISM

Let us assume that free will is the ability to act otherwise (Frankfurt 1988). Philosophers and scientists have challenged the existence of free will, proposing that all events, including neural events leading to decision making and behavior, are mechanistically determined by physical causes, a philosophical position called determinism (Harris 2012). Most scientists and many philosophers believe in some version of determinism. Determinism has led some to question the existence of free will if behavior is entirely determined and one could not have acted otherwise (Harris 2012). Neuroscientific evidence showing correlations between neural and mental events provides support for determinism, but this evidence does not necessarily alter the debate regarding whether free will can exist if determinism is accepted (Roskies 2006). Those who reject that free will and determinism can coexist are incompatibilists, either because they accept that free will exists but reject that determinism is true, a position called libertarianism (different from the political ideology), or because they accept determinism as true but reject that free will exists, a position called hard determinism (Roskies 2006). Compatibilists, on the other hand, believe that free will can exist even if determinism is accepted (Roskies 2006). Compatibilism is the predominant view within contemporary moral philosophy and the law and therefore forms the basis for many intuitions regarding moral and legal responsibility (Morse 2007).

Compatibilists reconcile free will and determinism by differentiating between the kinds of mental processes that are willed and those that are not. These "right kinds" of mental processes can be defined by a negative conception or a positive conception of free will (Glannon 2011). Negative compatibilism requires only that an action was not coerced, compelled, or constrained by external forces (Glannon 2011). An action is freely willed if these external factors are absent, regardless of whether internal mental states leading to actions are determined by neural events or not. Alternatively, positive compatibilism maintains that although all mental processes are the result of neural processes and are therefore physically determined, some of these conscious mental processes are themselves causal in decision making, and therefore constitute "the will" (Glannon 2011). Our beliefs, intentions, thoughts, and desires can therefore still be seen as causing our decisions, even if these concepts are the result of neural processes dependent on unwilled neural inputs. Frankfurt (1988) equates free will with second-order desires, which evaluate and regulate

first-order desires to determine a decision and action. Moral theory and the law equate the will with the process of evaluating beliefs, thoughts, desires, and intentions in order to make a behavioral decision (Morse 2004). Because of this, reasoning is seen as the ultimate causal link between mental processes (the will) and actions. We refer to the positive compatibilist notion of free will as psychological compatibilism, defining free will as the capacity to regulate one's behavior in response to thoughts, beliefs, intentions, and other psychological states.

NEGATIVE COMPATIBILISM AND CAUSAL RESPONSIBILITY: "MY BRAIN MADE ME DO IT"

According to negative compatibilism, free will is lost if a decision is unduly influenced by an external force that coerces, constrains, or manipulates the decision-making process (Glannon 2011). Although neural determinism is accepted in general, the assertion that neural events can lead to specific moral decisions has been used to try to exculpate defendants of criminal responsibility. In these cases, structural and functional brain changes are used to argue that the defendant's brain, and not their will, "made" them commit the crime. In other words, the defendant's brain is treated as an external force acting upon a separate mind. However, this argument violates the basic premise of compatibilism, where neural determinism is accepted to be true. "My brain made me do it" is explicitly dualist, with a mind and a will existing separate from the brain. If the brain and mind are treated as one unified phenomenon, a view supported by current evidence from neuroscience and accepted by compatibilism, then the argument "my brain made me do it" becomes meaningless. The legal system has not accepted that the brain is an external force in the same way that a coercive person, organization, or situation is, nor is it likely to do so in the future (Morse 2007). Thus, "my brain made me do it" is true, but is not a valid reason for rejecting free will and responsibility. To mitigate responsibility, a neurological abnormality must cause a specific impairment in a psychological function that contributes to normal moral behavior.

For this reason, bvFTD patients should not be absolved from moral and legal responsibility simply because abnormal proteins in their brain cause changes to their behavior. Neural events, even due to disease processes, cannot be viewed as an external force constraining free will and limiting responsibility, as this would undermine the framework upon which the compatibilist notion of free will is based. The disease process must be shown to alter specific psychological capacities necessary for appropriate moral behavior, limiting a patient's ability to have acted otherwise.

POSITIVE COMPATIBILISM, MORAL RESPONSIBILITY, AND THE "RIGHT KINDS" OF PSYCHOLOGICAL PROCESSES

Positive, or psychological, compatibilism maintains that there are specific neuropsychological processes that

distinguish willed from unwilled actions (Glannon 2011). These volitional psychological processes are paramount to normal decision making and constitute the prerequisites for free will and responsibility (Morse 2007). In the law, for example, moral responsibility depends both on whether a person actually commits the crime (*actus rea*), and on that person's intention to commit the crime (*mens rea*) (Morse 2007). Intentions are crucial in forming judgments regarding responsibility. Persons are not typically held responsible for accidental harms, unless they involve gross negligence, but can be found guilty of attempted but unsuccessful crimes such as attempted murder. Psychotic patients who act based on paranoid delusions are not held responsible for their actions if their intentions are not criminal, even if their false beliefs lead them to perform criminal actions that harm others (Morse 2007). Intentions are the internal, motivating reasons that we perform actions. The focus on intentions in determining moral responsibility again rests on the belief that intentions and mental states directly cause our moral behavior.

The defense of not guilty by reason of insanity is used in cases where, for example, immoral actions are committed by patients whose intentions may be seen as morally justified (harming someone in self-defense) but are based on delusions that are resistant to reason (believing that a victim is a persecutory agent of a government conspiracy). In these cases, intentions still lead to harmful behavior, but within the psychological understanding of the patient, the reasons for these intentions would not be seen as immoral. These cases depend on the delusions and abnormal thought content being resistant to reasoning, and thus outside the realm of free will. Because certain psychotic patients with paranoid delusions cannot understand that their behavior was wrong (because, according to their delusional thoughts, their behavior was not morally wrong), these patients are not judged to be morally responsible for their actions.

Do bvFTD patients intend to perform their antisocial actions in a manner that would make them morally responsible according to these criteria? The evidence thus far suggests that they do. bvFTD patients are aware of the harmful consequences of their actions (Mendez et al. 2005). Their intentions are to fulfill selfish desires (e.g., to obtain property or sex) without regard for the interests of others. Their behavior is not "accidental" or based on false beliefs. Rather, they lack other psychological processes necessary for normal moral behavior, such as the ability to empathize and consider the welfare of others when making social decisions. If moral responsibility is dependent solely on intentions, then bvFTD patients are morally responsible for their actions. One cannot argue that their intentions do not motivate their behavior, because their behavior aligns with such intentions. They appear able to reason through the consequences and wrongfulness of their actions without this understanding influencing their behavior (Mendez et al. 2005). What bvFTD patients lack, therefore, is the ability for moral reasons to influence their behavior.

REASON-RESPONSIVENESS: AN ALTERNATIVE COMPATIBILIST FRAMEWORK

Reason-responsiveness is defined as the ability for one's behavior to be altered by reasons (Fischer and Ravizza 2000; Glannon 2011). Reason-responsiveness has two requirements: (1) that an agent is able to understand and appreciate moral reasons, and (2) that an agent is at least moderately responsive to such reasons in terms of that agent's actual behavior (Fischer and Ravizza 2000). According to this position, if patients show systematic inability to alter their behavior in response to reasons, then they should not be held morally responsible for actions dependent on these reasons. Reason-responsiveness moves beyond rational thought and moral knowledge by acknowledging that there are other neuropsychological capacities that are paramount to normal moral behavior, willed actions, and responsibility.

Criticism for reason-responsiveness has focused on the extent to which an agent must be responsive to moral reasons in order to be held morally responsible (Fischer and Ravizza 2000; Fischer 2006). For example, strong reason-responsiveness requires an agent to always or nearly always change his or her behavior when there are strongly compelling reasons to do so. Fischer argues instead for a low threshold for reason-responsiveness, requiring only that an agent might change his or her behavior in response to compelling reasons (Fischer and Ravizza 2000; Fischer 2006). This highlights one important difficulty in using reason-responsiveness as a criterion for moral responsibility. Psychological capacities exist along a spectrum of abilities, and choosing a cutoff point between what is and is not morally significant reason-responsiveness is arbitrary and subjective.

An additional criticism is that patients may have different responsiveness to different classes of relevant reasons. Uncertainty in the neural and psychological mechanisms for reason-responsiveness can lead to the erroneous interpretation that this process is a unified psychological capacity. However, evidence from psychology and the study of neuropsychiatric patients shows the complexity of the decision-making process, with different psychological capacities contributing to different classes of decisions (Parkinson et al. 2011; Young and Dungan 2012). Decisions in social situations leading to moral or immoral behavior may rely on a unique subset of capacities beyond those required for decision making within other domains. Moreover, even within the moral domain, psychological mechanisms will contribute differently to different types of immoral behaviors. Because of this, as a practical matter, determining reason-responsiveness in a given patient remains challenging. Reason-responsiveness captures a component of our intuitions regarding responsibility but is too vague a concept to be useful in a given situation. A new neuropsychological framework is needed to approach the multiple capacities that contribute to reason-responsiveness.

A CONSTRUCTIONIST FRAMEWORK FOR DETERMINING REASON-RESPONSIVENESS

Compatibilists have attempted to define the "right kinds" of psychological processes that determine moral responsibility. These explanations have focused on the capacity for reasoning and, more recently, on reason-responsiveness as the psychological capacity necessary for moral responsibility. However, treating reason-responsiveness as a single capacity is problematic. Attempts to abandon the notion of responsibility in favor of consequentialist punishment (Greene and Cohen 2004) have an independent set of limitations. What alternatives remain?

Complex decisions are made using a constraint-satisfaction model, whereby multiple different variables are factored in parallel, each influencing the other, until a final decisional output state is determined (Churchland 2011). Such a model explains why each individual capacity seems important but insufficient to fully define the spectrum of moral responsibility. Accepting that multiple mental processes contribute to moral behavior makes it difficult to determine moral responsibility. First, different mental capacities will contribute to some, but not other, moral situations. Second, mental capacities exist along a spectrum, so determining whether a given level of impairment in a mental capacity, such as empathy, should absolve a patient of responsibility is challenging. Finally, each individual patient will have a unique pattern of preserved and impaired mental capacities that varies on a case-by-case basis. While impairment in one cognitive capacity might make a patient more likely to commit a crime, preservation of other capacities might allow that patient to still make the morally correct decision despite their deficit. They would be responsive to other types of considerations, and therefore would still be held responsible for their behavior.

One way to determine how a patient's unique profile of preserved and impaired mental capacities affects reason-responsiveness is to "construct" how a neuropsychiatric patient, with his or her current set of psychological capacities, would behave in a certain situation. First, neuropsychological testing would define the psychological capacities that are intact or impaired in a given patient. Next, this pattern of capacities would be used to construct a model of the patient's mind in a given situation and to predict that mind's responsiveness to relevant moral reasons. If a patient were unable to respond to the moral reasons in question, his or her moral responsibility would be diminished. In this constructionist model, reason-responsiveness is not a uniform process, but rather a pragmatic framework for understanding how specific considerations influence the behavior of patients based on their current psychological capacities.

THE CONSTRUCTIONIST FRAMEWORK IN ACTION: THREE HYPOTHETICAL SCENARIOS

bvFTD patients have intact moral knowledge and can verbalize reasons why an action is morally wrong, yet

perform the action anyway (Mendez et al. 2005). These patients therefore constitute an ideal population in which to determine the psychological processes important for moral reason-responsiveness, including reward processing, sensitivity to punishment, empathy, autonomic decision making, theory of mind, and social emotions. We use the constructionist framework to examine how these processes influence reason-responsiveness and moral responsibility in three hypothetical cases involving antisocial behaviors in bvFTD patients.

Case 1

A 60-year-old woman with bvFTD frequently goes to the art store to buy supplies for her drawing. Recently, she has felt that the prices for the supplies are too high, so she has been stealing them. When confronted by the store manager, she continues to argue that her actions were justified and tries to bargain with the manager about the price. Despite threats to call the police, she nevertheless continues to steal from the store, and is ultimately arrested.

Pertinent Neuropsychological Deficits: Regard for Consequences

Deficits in processing reward and punishment relating to future outcomes have been found in bvFTD patients using the Iowa Gambling Task. The task was originally designed to study patients with medial prefrontal cortex damage who continue to pick cards from the high reward/higher loss decks, in some cases even after explicitly acknowledging that by doing so they would lose money over time (Bechara et al. 1997). This suggests that while these patients could explicitly learn rules about future rewards and punishments, this knowledge was unable to motivate their actual behavior. Similarly, patients with bvFTD perform poorly on this task compared with patients with Alzheimer's disease and age-matched controls (Kloeters et al. 2013; Torralva et al. 2009). In this case, the patient performed poorly on the task, indicating that the risk of future punishment did not influence her behavior.

Constructionist Formulation

Not stealing property from others is dependent in part on the desire to avoid the negative social consequences of norm-violating behaviors. This is especially relevant when stealing inexpensive items from a store or business, where there is less direct harm to individual persons. In this case, the woman continues to steal despite increasingly negative consequences to her actions. She understands that stealing is illegal and may result in punishment, but the threat of future punishment does not motivate her behavior, especially in the setting of a perceived injustice. Based on her neuropsychological testing, she lacks the ability to respond to the morally relevant considerations when stealing the art supplies, and therefore should not be held morally responsible.

Case 2

A 64-year-old woman with bvFTD is racing home to eat a piece of delicious cake that her daughter has made. She turns quickly down a side street without looking and hears a thump. She stops and looks back, seeing a man lying in the street, holding his leg and screaming. A passerby turns and runs toward him. If he's currently conscious and assistance is on the way, she reasons, he is not going to die, and if she stays to help him she will have to wait to eat the cake. She drives away, leaving the man in the street.

Pertinent Neuropsychological Deficits: Empathy and Emotional Recognition

Patients with bvFTD have an impaired ability to empathize with others, to feel concern about their well-being, or feel personal distress at the suffering of others, compared to patients with other types of dementias (Eslinger et al. 2011; Rankin, Kramer, and Miller 2005). More fundamentally, bvFTD patients have difficulty detecting negative emotions in others when viewing pictures (Rosen et al. 2002), movie clips (Werner et al. 2007), or hearing distressed voices (Hsieh, Hodges, and Piguet 2013). They are additionally impaired in expressing their own emotions, including facial expressions and autonomic nervous system responses to experiencing embarrassment (Sturm et al. 2008), and disgust (Eckart et al. 2012). Several studies suggest this extends to emotions important for social and moral behavior (Moll et al. 2011; Rankin et al. 2004).

The patient in this case was found to have deficits in empathic concern, in detecting pain and other negative emotional expressions in others, and in experiencing regret, guilt, or embarrassment.

Constructionist Formulation

The patient had increased desire to consume sweet foods (part of the diagnostic criteria for bvFTD), which led her to drive recklessly. When she hit the man walking, she was unable to understand the pain and suffering he might be experiencing due to her deficits in empathy and emotional recognition. She used the objective cue that he was screaming and therefore conscious and the proximity of aid to conclude that the injury was survivable. She was not compelled by regret or remorse to stay and help him. After weighing her strong desire for sweet foods against his injury, she continued on her way. Although there are many obvious reasons she should have helped the man, her psychological impairments elicited on neuropsychological testing prevented those reasons from influencing her behavior, thereby diminishing her moral responsibility.

Case 3

A 62-year-old woman with bvFTD becomes upset when her husband argues that they shouldn't go on vacation. Her husband has terminal cancer, and he would like to spend his remaining time with their children. She reasons that since he will die soon anyway, she should kill him now so that she can go on the trip

without his interference. She waits until he goes to sleep later that night, and then grabs a gun from the garage and shoots him in the chest, killing him.

Pertinent Neuropsychological Deficits: Theory of Mind and Harm Aversion

Patients with bvFTD have an impaired ability to understand the mental state of other persons, a process called theory of mind (Lough et al. 2006). Theory of mind is what allows normal individuals to take an agent’s intentions into account when assigning moral responsibility for a harmful action—for example, to differentiate between manslaughter and murder. When given a series of hypothetical moral dilemmas, bvFTD patients acted as if the intentions of the agent did not matter: Accidental harms were condemned due to the negative consequences, while attempted but unsuccessful harms were not judged as immoral (Baez et al. 2014).

In another set of moral dilemmas, bvFTD patients were less averse to harming others if such actions resulted in a net overall utilitarian benefit. For example, bvFTD patients were more likely to push a stranger over a bridge if doing so would stop a trolley cart that would otherwise kill five workers trapped on the tracks (Mendez, Anderson, and Shapira 2005; Mendez and Shapira 2009). While normal controls and patients with Alzheimer’s disease felt an aversion to killing the man on the bridge, bvFTD patients felt no aversion to harming him, focusing instead on the relative benefit of saving the five additional lives.

The patient in this case had impaired performance on theory of mind tasks and was more likely to judge accidental harms as wrong, while judging attempts to harm others that were unsuccessful (e.g., trying to poison someone but giving sugar instead, leading to no actual harm) as permissible. She answered that she would be willing to push the man off the bridge and perform harmful actions in other scenarios if there were a slight overall benefit to doing so.

Constructionist Formulation

In this more complex situation, the patient has several impairments that made her less responsive to morally important considerations. She was unable to appreciate that there would be a meaningful difference between her husband’s dying from his disease, and her causing his death. Moreover, she was not influenced by the aversion to personally causing him harm. During the action, his potential suffering did not influence her, and afterward she did not experience regret or remorse. However, she did understand that by killing her husband now she was hastening his death by several months. Using utilitarian-like reasoning, she had the capacity to consider alternatives (such as merely leaving on vacation without her husband) that would result in greater net benefit than the course she chose. She had the time necessary to consider these alternative decisions. Therefore, while her neuropsychological deficits contributed to her behavior, she maintained responsiveness to other considerations that could

have influenced her to make the morally correct decision. Her punishment might be mitigated, but she nevertheless should be held morally responsible for the murder.

CONSTRUCTIONIST FRAMEWORK: SUMMARY AND LIMITATIONS

A summary of mental processes contributing to moral reason-responsiveness is provided in Table 1. These cases demonstrate the complexity of determining moral responsibility in FTD patients with a range of neuropsychiatric deficits. Each patient had knowledge that her behavior was morally wrong, yet committed the crime anyway. It is only by “constructing” that patient’s reason-responsiveness, due to her unique pattern of impaired and preserved mental processes, that we can begin to understand why the patient committed the crime, and whether she could have potentially responded using other cognitive processes to arrive at the morally correct behavior. In doing so, the constructionist framework allows for a simplistic but pragmatic approach to determining responsibility in neuropsychiatric patients.

There are several important limitations to the proposed model. One is that there is no precise metric for balancing the relative weights of deficits in one domain with preserved capacities in another domain. This difficulty is partly due to imprecise tests to measure morally relevant capacities. While neuropsychological testing provides invaluable information, tasks targeting domains important for social and moral behavior, such as empathy, theory of mind, and social decision making, are less developed and validated than testing of verbal memory, basic attention, and language. Further refinement of tasks targeting these capacities is necessary. Additionally, while tests can provide some metric of capacities within a specific domain, the degree to which these impairments mitigate responsibility still depends on the normative interpretation of lawmakers, judges, and jurors. The constructionist framework gives an approach to this process, but not a precise equation for translating deficits into a final judgment of responsibility. Finally, determining the ability use alternative capacities to be responsive to morally relevant reasons is challenging. In Case 3, for example, it is argued that the amount of time and planning that preceded the crime

Table 1. Capacities contributing to reason-responsiveness.

• Emotion recognition	• Emotional expression
• Empathy	• Theory of mind
• Response inhibition	• Reward sensitivity
• Social emotions	• Harm aversion
• Autonomic decision making	• Logic/reasoning
• Planning/executive functioning	• Social norm
• Prospection of future consequences	• Knowledge
	• Loss aversion

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suggests that the patient had the ability for utilitarian reasoning to influence her behavior. To what extent should we expect this capacity to compensate for behavior in other situations? Should this be dependent on the amount of planning involved in behavior in question (as implied by Case 3)? Further empirical data in patients will be helpful in addressing these questions. The flexibility of the constructionist framework is useful despite these limitations because it allows for impairments in a broad range of mental capacities to be weighed differently depending on the specific patient and behavior in question.

While this article has focused on using the constructionist framework to approach moral responsibility in patients with FTD, the same approach can be applied toward other patient populations. There have been many individual cases of patients with tumors, cysts, or other types of neurological injuries in persons with immoral behavior (Batts 2009). The question that arises in such cases is whether the brain damage should diminish that person's responsibility for his or her behavior. The constructionist framework approaches this question by asking what psychological capacities are affected by that brain injury, and how a patient with such limitations would be able to respond in the situation in question.

Importantly, the constructionist approach can be applied to "purely" psychiatric patients, without evidence of gross neurological damage. To the extent that a psychiatric disease impairs specific psychological functions important for moral behavior, the constructionist framework can be used to help determine if responsibility should be mitigated. As discussed previously, diminished responsibility should be determined not by the presence or absence of a specific disease itself, but rather by a disease's impact on the psychological processes necessary for normal moral behavior. The underlying pathology of that disease, whether it be "neurological" or "psychiatric" in the classic sense, is irrelevant.

CONCLUSIONS

Determining moral and legal responsibility in neuropsychiatric patients is challenging, as one must establish not only that a neuropsychiatric disease contributed to a behavior, but that this contribution affected the patient in such a way that he or she could not act morally. The philosophical basis for this determination is psychological compatibilism, which states that specific psychological processes cause moral behavior, even if these processes are neurally determined. However, attempts to define this psychological process as a single entity, whether rational thought or reason-responsiveness, fail to explain many of our intuitions regarding moral responsibility in neuropsychiatric patients. Instead, moral behavior is the result of multiple psychological processes, each contributing importantly and specifically to behavior. Deficits in any of these capacities will lead to impaired reason-responsiveness and

therefore diminished responsibility. The relationship between neuropsychological performance, reason-responsiveness, and immoral behavior requires further study, and bvFTD patients represent an ideal patient population for beginning to investigate these relationships. Determining the degree to which responsibility is diminished with a given degree of neuropsychological impairment is difficult, but the constructionist framework provides a useful model for addressing this question.

This does not require a radical transformation from our current system of justice, but rather a greater appreciation for the importance of multiple psychological factors in determining moral responsibility. Federal law and a majority of states still adhere to variants of the *McNaughton Rule* (*M'Naghten's Case* 1843). However, a growing number of states have adopted a more comprehensive model penal code test, supported by the American Legal Institute (*American Law Institute* 1962). The model penal code allows for a lack of criminal responsibility if the defendant is substantially unable to appreciate the wrongfulness or criminality of his or her act, or is substantially unable to conform his or her conduct to the requirements of the law. The constructionist framework allows one to systematically approach whether a patient had the capacity to conform his or her behavior to the law. Adoption of standards similar to the model penal code will help to ensure that neuropsychiatric patients, such as those with bvFTD, are treated appropriately within the legal system.

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CONFLICTS OF INTEREST

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