COMMENT
Pharmacological Cognitive Enhancers: Comment on Smith and Farah (2011)

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Smith and Farah (2011) provided a thought-provoking and perhaps deliberately provocative literature review of the use of stimulants to improve cognitive functioning in humans. They addressed the apparently increasing willingness of individuals mostly in the United States to use stimulants for this purpose and then summarized published literature that explores whether stimulants actually improve specific aspects of neurocognitive function. Although calling for more research, they tentatively concluded that stimulants indeed may be "smart pills" for some people under certain circumstances. This comment emphasizes that they never actually defined the desired qualities of a smart pill, seemed to accept the unproven axiom that slight improvements in specific tests constitute meaningful enhancement of intelligence, and failed to consider the possible costs to individuals and to society of promoting the use of this class of medications for such a purpose.

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The urge to do better—to be stronger, faster, more attractive, smarter—may be a nearly universal human trait, and the use of aids to achieve that end undoubtedly go back to the earliest days of humankind. Current controversies in sports about the use of steroids and other performance-enhancing drugs are but one modern example of how an increasingly sophisticated understanding of the human body has led to pharmacological interventions to achieve such ends. Smith and Farah (2011) examined the issue of using pharmacology to improve brain function, focusing primarily on the potential role of stimulants such as methylphenidate and amphetamine as "smart pills." Their extensive review first documented the increasing willingness of some healthy individuals to use stimulants for that purpose and then examined the published literature about whether and to what degree stimulants actually achieve that goal. They concluded both that use of stimulants to improve intellect is widespread and that the research supports such use, at least to a limited extent. They ended with the seemingly inevitable call for more research.

In our view, this detailed review of research on stimulant effects on the brain lacks a much-needed conceptual framework. What, exactly, should one be seeking in a smart pill? Should it enhance creativity, memory, knowledge acquisition, concentration, fluid intellect, or all of the above? What about matters of task persistence or improved signal-to-noise detection? Would a drug that produces a sustained decrease in the need for sleep qualify as a smart pill, as it could expand the amount of time individuals have to use their brains? Should improved optimism or confidence be considered an asset? Especially important in the context of stimulants is the matter of duration of action. What is the value of a smart pill that has only a limited duration of action?

Smith and Farah (2011) implied that the widespread use of stimulants by individuals with no diagnosable medical or psychiatric condition is prima facie evidence that the primary purpose is to improve cognitive functioning. Yet, even without raising the matter of substance abuse, it is worth noting that stimulants have common actions usually labeled as side effects that may have intrinsic value in certain situations; for example, students may wish to stay up for extended periods studying or simply might be seeking to get high (Arria, O'Grady, Caldiera, Vincent, & Wish, 2008; Malinauskas, Aeby, Overton, Carpenter-Aeby, & Barber-Heidal, 2007).

Smith and Farah (2011) made clear in their introduction that they chose not to review the literature relating to ethical issues of smart pills, asserting that such matters already have received considerable attention. Their explicit goal was, instead, to lay out empirical evidence of what stimulants actually do to brain function. Indeed, the authors did succeed in laying out an uneven but fairly large literature on the observed effects of stimulants on various cognitive tasks. Readers are free to decide for themselves, but the summary judgment seems not far from the conclusion Rasmussen (2008) reached in a review of research done on stimulants during World War II: Enhancements with stimulants are hard to demonstrate, especially when compared to caffeine, and seem to relate more to individual perception of increased ability rather than to objective improvement of function.

Missing from this review is an objective accounting of side effects and potentials for abuse of these same medications. One unintended consequence of the marked increase in stimulant use to
treat attention-deficit/hyperactivity disorder not only in children but also in adolescents and adults has been a massive increase in the production and availability of these drugs, especially in the United States, with more than a tripling of the supply between 1996 and 2005 (Swanson & Volkow, 2009). Increased diversion—that is, increased use outside of the prescription per se, as affirmed with Smith and Farah’s (2011) review of reported use patterns—should not be especially surprising but does seem to be an appropriate cause for concern. Deliberate expansion of the use of stimulants to a much broader population seeking to be smarter raises the specter of considerably more misuse of these drugs, as occurred in earlier eras when stimulants were not subject to the current controls (Klee, 1997; McCabe, Knight, Teter, & Wechsler, 2005; Rasmussen, 2008).

Smith and Farah (2011) did return to ethical matters in their discussion but remained surprisingly silent on a question of perhaps far greater relevance to their central theme. Specifically, even if stimulants could enhance intellectual functioning at least to some extent, how likely is it that their use would improve individual outcomes? In his popular book Outliers, Gladwell (2008) argued persuasively that intelligence per se is only one of a large number of factors in determining success and that there is no strong correlation between intelligence and a wide array of positive outcomes (see also Farah et al., 2004; Sternberg, 2004; and others).

Smith and Farah (2011) have provided a valuable service in bringing together a diverse array of research on stimulants, and their review may indeed facilitate discussion on the merits and risks of pharmacologically induced cognitive enhancement. However, we believe that, based on the evidence accumulated to date, the answer to their question would seem to be no: Stimulants are not smart pills. Left unresolved is whether the pursuit of such a nostrum is likely to succeed—and what the cost to individuals and to society might be if it did.

References


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