

Smoking or quitting: choice, true preferences, tobacco harm reduction, and other neglected considerations

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Abstract

The extensive research on choices about smoking and the methods people use to quit is almost always interpreted in naïve and unhelpful ways. This is partially due to treating smoking cessation as if it were medical disease treatment, despite the fundamental differences, most notably that smoking is a choice that has benefits as well as costs]. The main problem, however, seems to be a failure to recognize what it means when someone indicates they want to quit smoking. An understanding of the preferences that motivate smoking and cessation allows us to categorize would-be quitters, particularly identifying the difference between first- and second-order preferences for quitting. This demonstrates the absurdity of attempts to determine what cessation method is “best” or even “better”, as well as explaining the frequent failure of medical interventions. This analysis offers advice for both readers of the research and those who wish to quit smoking.

Introduction

There is an extensive literature on how people attempt to quit smoking and how they succeed. It is almost always interpreted in naïve ways, or intentionally misinterpreted to try to promote marketed products or support ideological positions. The result is that despite all the research effort, there is remarkably little operationalizable understanding of what the science means, and its interpretations tend to impede rather than aid smokers who want to quit.

People quit smoking using a variety of methods that can be divided as follows:

- tobacco harm reduction (THR) (substitution of low-risk smoke-free tobacco products like smokeless tobacco or electronic cigarettes (e-cigarettes))
- assisted quitting to abstinence (including on-label use of pharmaceutical nicotine products (NRT) and other drugs, as well as therapy)
- quitting without using those aids (sometimes called “cold turkey”, though that phrase also implies immediate cessation rather than gradual reduction, but either trajectory can fall into this category)

There is a natural tendency to ask which method is best. However, this tendency is fundamentally misguided and interpretations of studies that attempt to answer such questions are usually fundamentally flawed.

For example, Rodu and Phillips (2008) (1) looked at American ex-smokers' methods of successful cessation compared to current smokers' most recent quit attempt to provide a measure of success rates. As of 2000, smokers who attempted to switch to smokeless tobacco on their last cessation attempt were far more likely to have become former smokers than those using other methods. The authors took pains to not suggest that the result should be over-interpreted simplistically, such as claiming that switching to smokeless tobacco is the best smoking cessation method. Recently, Brown et al. (2014) (2) reported similar results for e-cigarettes in the UK. The careful wording of their conclusion, "those who use e-cigarettes appear more likely to be able to remain abstinent", is accurate. But it lends itself to the over-interpretation that e-cigarettes are the better option for smoking cessation and exactly that misinterpretation has been widely touted (e.g., (3-5)).

Similarly, a recent experiment by Bullen et al. (2013) (6) found that, in a clinical setting with a convenience sample of volunteer smokers, those who were assigned to use a particular e-cigarette product were barely more likely to become smoking abstinent than those assigned an NRT product. This has been interpreted as both "e-cigarettes are better for quitting" (e.g., (7)) and "e-cigarettes are no better for quitting" (e.g., (8)), depending on the political bias of the observer. But, again, neither such interpretation is correct. The apparent contradiction between this and the previously cited study can also be explained by the common misinterpretations.

At the simplest level, the misinterpretations are a case of not understanding what "better" even means in the presence of heterogeneities, and to a lesser extent, the resulting confounding and selection bias. At a deeper level, it is the result of a fundamental misunderstanding of tobacco use and cessation behavior, particularly the erroneous conceptualization of tobacco use as a disease, a wretched state in which every victim shares the same desire for a cure. The following analysis explains why the above interpretations of the study results are incorrect and attempts to correct the underlying misunderstanding by creating a taxonomy of smokers, in terms of their preferences for quitting.

Analysis

Population heterogeneity: Smoking is not a disease, and smoking cessation is not a medical intervention

A debilitating misconception about smoking – held quite literally by some, but also influencing the thinking of most commentators, including some who explicitly deny its validity – is that it is a disease and it is useful to think of it as such. That view suggests using a top-down "evidence-based medicine" approach to determine the potential of cessation options. The misguided analogy is frequently taken to its extreme with claims that cessation attempts should focus on medical therapies that are approved by regulators and endorsed by the medical industry. This medicalization of a consumer choice (smoking) has unfortunately resulted in an emphasis on cessation aids (drugs and therapy), all of which have abysmally low success rates when considered as medical treatments.

When smoking is recognized as a behavioral preference, and thus cessation is recognized as an alternative choice, it becomes apparent that questions like “which cessation method is best?” and statements like “method X works 60% better than method Y” are misguided. In a behavioral preferences and consumer choice context it is impossible to globally rank-order alternatives, because what is better for one person is not what is better for another. This should be as obvious for smoking cessation as it is for other consumer preferences such as foods. We know better than to ask “which food tastes better?” Yes, we could look at market share and guess whether a random individual likes Coke better than Pepsi in order to tell a naïve consumer which one to buy, but it would be far more sensible to ask him which tastes better to him or simply let him experiment and choose. The tendency to treat smoking behavior research as if it were clinical medicine and not social science is an intellectual failure that has done enormous practical damage. Moreover, many of those who rightly push back against the most obvious failure – the touting of usually-ineffective medical cessation methods to the exclusion of other methods – rapidly fall into the same trap and, for example, make similar claims about e-cigarettes.

In choosing a *medical* practice standard, it makes sense to ask which treatment is best on average because the best treatment should be assigned to everyone who needs it. Sometimes it is possible to identify observable characteristics of a person or disease that favor one treatment over another (though this is more commonly applied to minimizing adverse effects than to treatment effectiveness), but even then there are just a few broad categories. It is often the case that only one treatment can be attempted, or at least treatments can only be attempted one at a time, with it being costly to fail with a less promising one before trying the more promising. Thus, identifying what is usually the best treatment option is useful. Moreover, in the disease treatment context, the individual being treated, or the subjects in medical research, will not typically have any idea about or play any role in determining which treatment is more likely to work. Thus, the goal of figuring out what is best on average makes sense.

This contrasts with a preference-and-choice situation. In that situation, there is clear heterogeneity of individuals, and those individuals typically know – or could be guided to understand – what their relevant individual characteristics are. For a given individual, one option is more promising than others, and it is possible to assess which it is. It is often observed (sometimes as a sophisticated view about the philosophy of probability and sometimes as a know-nothing objection to statistics) that the real probability of an event is either 100% or 0%. Either a smoking cessation attempt is successful or it is not. While this is an unhelpful observation in the context of choosing which medical intervention to prescribe to everyone with a particular disease, it is quite relevant to smoking cessation: For a particular person at a particular time, a particular method will either succeed or fail. It is useful to try to figure out which will succeed for the particular individual and offer advice; it is not useful to figure out which would work better, on average, if prescribed to everyone.

For medical interventions, the research methods of clinical trials are generally appropriate, and the ideal experiment can represent what would occur in a real-world

medical practice. This is emphatically not the case for smoking cessation, where the experiments do not resemble the real-world circumstances of interest. Observational studies can be very informative, but misinterpreting them as if they were medical experiments, despite obvious self-selection and confounding, further compounds the errors of interpreting choice as treatment.

Some basics of individual preference

Understanding the types of smokers who are interested in quitting requires some background about preference and choice.

Smokers are generally rational individuals who weigh the benefits of smoking against the costs. Sometimes the degree of rationality is overstated and sometimes particular technical failures of rationality can be identified (see, e.g., (9-12)). But setting aside details of how perfectly informed and economically rational smokers are, we know that smoking is very much not like a disease, where everyone would prefer to just be rid of it entirely. Smokers' behavior can be described in terms of preference orderings across worldly states. This concept has been explored in depth previously (e.g., (13)), but has been almost entirely overlooked in attempts to understand smoking cessation desires and methods.

To understand preferences, it is necessary to recognize that smoking and other tobacco product use has benefits. Historical usage rates among populations where there was little worry about health effects and no social demonization show that the majority of humans find tobacco use to be a positive experience (14). Many people find that it provides very substantial benefits in terms of cognitive enhancement or relief from psychological difficulties; there is almost no research that attempts to quantify the portion of the population, but it appears to be in the order of 10-20%.

While the fact that smoking has benefits is obvious, it is usually implicitly denied in the context of smoking cessation by anti-tobacco orthodoxy. Instead of recognizing that consumers make choices based on their assessment of the costs and the benefits, the implicit view in anti-tobacco writings is what one of us (CVP) has dubbed the *demonic possession theory* (15). If one starts with the premise that tobacco use confers no benefits and thus tobacco use behavior cannot be driven by preferences and volition, the claim might as well be modeled as if people's actions were being controlled by some other entity whose goals are beyond our ability to comprehend. With such an implicit assumption, rational analysis is precluded because it is assumed that the demon has arbitrary or unfathomable motives. Perhaps it can be forced to behave better, but it cannot be rationally analyzed or persuaded.

It is worth noting that an appeal to the concept of "addiction" changes nothing about the observation that smoking has benefits, even setting aside that there appears to be no scientifically defensible definition of that word in this context (16). Whatever it is that someone means when they say a smoker is "addicted", they are saying that the motivations created by this construct are part of the individual's existing preferences, and thus part of her basis for preference and volition. Moreover, even if someone insists on

not “counting” the preferences that come from the “addiction” itself (an arbitrary distinction that has no apparent ethical justification and clearly does not affect the practical reality), it does not change the fact that smoking has other benefits. This observation does not diminish the importance of the acquired hunger-like desire, that results from smoking and to a lesser extent from other product use (“craving” is sometimes used to describe this, though that word is also an attempt to create the misleading impression that this phenomenon is not essentially a *preference* (17)). Such acquired desire is common across many forms of consumption (e.g., listening to a particular type of music), and smoking is probably more similar to everyday acquired desires than it is to hard drug “addiction” for most consumers, though the feeling undoubtedly tends to be more hunger-like for any drug consumption. This source of preference to continue to consume tobacco (or just nicotine) is clearly strong for many individuals who believe (possibly incorrectly) that fulfilling the “cravings” alone, rather than other benefits, is the reason they prefer to continue to use tobacco.

In the real world, the lack of demons means that part of someone’s preference ordering can be inferred from behavior, since choices follow from preferences. Barring unusual circumstances (in particular, Category 2, below) a smoker prefers smoking over abstinence, since abstinence is an option but is not being chosen. Smoking has costs and benefits, and someone choosing to smoke is indicating that, to her, the benefits outweigh the costs. This fundamental preference ordering is someone’s *first-order preferences*, and may differ from her *second-order preferences*. Second-order preferences are a preference about one’s first-order preference ordering. That is, someone might prefer to smoke rather than to be abstinent (her first-order preference – i.e., her *actual* preference), but she might also prefer to have different preferences: she wishes she preferred abstinence to smoking (her second-order preference) (18-20).

Comparing what people say they want to do and what they actually do tends to reveal their first- and second-order preferences. The aforementioned combination of first- and second-order preferences appears to describe a large portion of the smoking population. It is difficult to reconcile claims like “surveys show that the vast majority of smokers want to quit” with the reality that the vast majority of smokers continue to smoke. But the apparent contradiction can be easily explained by interpreting the survey responses as the voicing of second-order preferences. That is, a large portion of smokers would *prefer to not prefer* to smoke, even though the reality is that they prefer to smoke, which is why they continue to do it.

Exactly what that second-order preference ordering means varies. It can just mean someone wishes that the net benefits from the currently dispreferred choice, abstinence, could be made higher than those from their preferred choice. For most consumer choices, we would prefer that a non-chosen option would magically become so much better that we could exercise the option to change to it and improve our welfare, so this is almost certainly true.

The second-order preference could possibly indicate a desire to lower the net benefits from smoking so they dropped below that of abstinence. To the extent that this means “I

would like to eliminate the craving I have acquired, so that I do not have to smoke to merely satisfy that, as if I had never smoked”, it is rational and understandable, though like most such wishes, quite possibly not achievable. (Indeed, the possibility that this is the common explanation suggests methods for guiding smokers to understand what they really desire. However, it should be recognized that coming to the realization that this is the motive might be misguided in that the smoker would discover that the other benefits from smoking were greater than expected.) This is quite different from wishing one’s overall welfare in the still-smoking state be lowered in order to bring about this preference ordering, as implied by tobacco control rhetoric about “helping” smokers by imposing punitive taxes on them. While a few smokers probably do genuinely wish to have such punishment imposed, a genuine preference to lower one’s welfare until a behavior change is preferred is rare, for obvious reasons. Anyone arguing that this odd preference exists faces a substantial burden of proof, and we are aware of no serious attempt to present evidence that this “help” is actually widely desired.

To some extent the survey responses also mean the smoker would prefer to conform to the social pressure to self-identify as someone who wants to quit smoking. Indeed, the fact that they are barraged with the message they really would prefer to quit probably partially explains why so many respondents are so focused on their second-order preferences. For most topics it does not even occur to people to be aware of what they would prefer to prefer (few would falsely respond to a marketing survey about what they prefer in a hotel room with “I value a good work desk more than a nice shower” as a result of preferring to prefer to be focused more on work). The key point for present purposes, though, is that the exact nature of this second-order preference, and even the fact that it is second-order, is probably not recognized by most smokers.

Note that it is important to not let the terminology create the impression that there is something “higher order” about second-order preferences. If anything, it is more useful to think of them as being *less* “real” than first-order preferences.

The smoking cessation orthodoxy misinterprets the second-order preference as first-order and convinces people to embrace this misconception. They interpret survey responses or other communications of the simple statement “I want to quit smoking” as first-order, even though the lack of corresponding action means this is almost certainly not accurate. They then take this as an invitation to use any means at their disposal to force smokers into abstinence, claiming – contrary to everything we know about human preferences and behavior – that smokers benefit from or even prefer suffering the ensuing punishment. Not surprisingly for an action predicated on false premises, this usually results in failure. While the resulting policy actions themselves do an enormous amount of social damage, arguably even more harm is done by convincing smokers of the misconception. An exploration of the true nature of someone’s preferences is critical for those who wish to assess smoking cessation methods, and could prove crucial for the individual who is considering quitting.

Categorizing smoking cessation desires and behaviors

The following taxonomy describes smokers who are interested in quitting in either the first- or second-order sense, and it allows clearer thinking about competing cessation methods. These categories should not be mistaken for epidemiologic *response types* (i.e., how an individual smoker will respond to a particular intervention (21;22)), since they do not perfectly correspond. Still, they are far closer to the response types than the usual covariates, such as duration of smoking, smoking intensity or level of dependence measures (e.g. Fagerström tolerance test scores). Those covariates have the advantage that they are easy to measure, which is why they are used, but even such lamppost methodology could be improved by understanding that the easily measured variables are useful only insofar as they are proxies for the decision-relevant characteristics.

Employing the concepts of first- and second-order preferences, smokers who have an inclination to quit can be divided into decision-relevant categories as follows:

1. The smoker has decided that being abstinent is the best choice and is correct that this is his true first-order preference.
2. The smoker has a genuine first-order preference for abstinence, as in 1., but only in the long-run equilibrium because the cost of the transition creates a short-run preference for smoking. That is, the smoker would genuinely prefer being a nonsmoker, but withdrawal effects create a short-run preference for smoking.
3. The smoker has a second-order preference for abstinence, but his true first-order preference ranks smoking over abstinence (even in the long-run), and he does not really understand the difference or its importance (and thus identifies as someone who wants to quit).
4. First- and second-order preferences as in 3., but the smoker understands that his second-order preference is second-order (though he probably would not describe it in those words). Thus, his “wants to quit” means that he knows he does not really prefer to quit, but is hoping to find an option that he prefers to smoking. This would entail finding an alternative to smoking that on net (all costs and benefits considered) is preferable.

For completeness, we include but do not analyze, the remaining category:

5. The smoker does not want to quit, does not have a second-order preference to want to quit, and does not have an active desire to find an alternative to smoking (he presumably has a latent second-order preference – like we all do about everything – for some other achievable state, like abstinence or switching, to magically become more attractive still, but recognizes that such magic is seldom a real option).

As with most economic analyses of preferences, this categorization does not depend on what produces the preference orderings (psychoactive drug benefits, aesthetics, health concerns, habit/“addiction”, social pressure, politics, etc.). The categorization also does not predict an individual’s response to a particular alternative product, such as how satisfying they find e-cigarettes versus nicotine gum. Individual preferences about products or actions are independently important in determining which specific cessation method is best for the individual. This further points out the folly of seeking a best alternative at the population level.

Those in 1 and 2 genuinely would prefer abstinence, all costs and benefits considered. Those in Category 3, who prefer to smoke but mistakenly self-identify as preferring to not smoke, which appears to describe the majority of smokers, are often mistaken for being in categories 1 or 2. This conflation occurs partially because Category 3 (to say nothing of 5) exists contrary to the prevalent “demonic possession” fiction that smoking has no benefits. It is therefore inconceivable for those who believe in that fiction, as well as simply being inconvenient for the rhetoric of anti-smoking. But to a large extent, the conflation probably reflects a genuine failure to understand second-order preferences. Those in Category 3 probably think they are in 1 or 2; some might just be paying lip-service to the social pressure to declare a preference for quitting, but most probably do not even realize they prefer to smoke. They are not immune to the barrage of messages that everyone wants to quit and that becoming happily abstinent is just a matter of finding the right method, even though their experience tells them otherwise. Moreover, they usually lack the vocabulary to describe second-order preferences. The concepts of “inveterate”, “core”, or “hardened” smokers, and debates about whether there are any such people, can perhaps be made more concrete with reference to the large population of smokers in Category 3. When a behavior is understood in terms of preferences, there is no need for words like “inveterate” – someone just considers the behavior to have net benefits and chooses to not quit. Failing to understand the role of preferences and second order preferences creates the apparent need for these additional complicated concepts, but the reality is actually much simpler.

Category 3 can be further divided by the distinction between having the near-universal second-order preference of “I wish I was just as happy as a non-user of tobacco as I am now”, versus the relatively rare preference of “I wish I found smoking so unpleasant that it was actually worse than abstinence.” The former of these is obviously desirable in the same sense as “I wish I enjoyed being productive all evening as much as I enjoy watching television” or “I wish I liked broccoli as much as I like ice cream.” The latter of these might be the genuine preference of a few people who are torn by self-control issues, but seldom does someone genuinely have a second-order preference that their utility from a preferred state be *lowered* in order to reverse their first-order preferences. Making abstinence as enjoyable as smoking is nearly impossible to actualize (if it were, it would have already been done), while making smoking less pleasant can be engineered (as with higher taxes and smoke-free laws).

For more exposition and details on these points, see (19;23).

What will facilitate quitting for someone in each category?

Smokers in Category 1, who genuinely prefer to quit and have no great obstacles to doing so, but nevertheless have not acted on their genuine preferences, probably just need a focusing moment to break their hysteresis (inertia). Any focusing event could provide this, which could explain the consistent “success” of null-treatment arms in smoking cessation studies. The quit rates in those arms are not high, but are still consistently higher than the average rate of smoking cessation. That latter average rate would be the “spontaneous recovery” rate expected if the medical conceptualization of the “treatment”

were correct. At any given time, some portion of all smokers are in Category 1, and if they happen to enter a cessation program it can be the focusing moment they need, even if the intervention itself is worthless.

Two of us (CVP, CMN) once planned a cessation intervention in which random smokers were approached by a university researcher (preferably an attractive member of the opposite sex to aid recall and enhance enrollment) and told “we are collecting details about successful quit-smoking stories; could we get your contact information so, *just in case* you quit in the next few months, we can learn your story?” The hypothesis was that even though we did not suggest to the subject that we were trying to assist quitting, this would not be significantly less effective than most other interventions because it provides the focusing moment that changes the Category 1 smoker from “I will quit soon” to “now is the right time.”

Smokers in Category 2, who face a short-run barrier to reaching their equilibrium state, could benefit from some tool that reduces or helps deal with the short-run cost that occurs when moving to the long-run preferred state. The premise behind almost all smoking cessation drugs and organized interventions – or at least underlying their marketing – is that many smokers are in this category. The experimental evidence shows otherwise, however, with only a few percent more smokers quitting with NRT or counseling as compared to those who quit in the null-treatment comparison group. (Witness how often reports from these trials, and even the Cochrane review of them (24), emphasize arcane test statistics and do not even report the absolute numbers because they are just so terribly low.) That is, all study subjects were provided with a focusing event, and so even those who quit among the group receiving an ostensibly useful intervention mostly did so because they were in Category 1, not because of the treatment. In those experiments, the vast majority of participants – those who never cease smoking or resume over the short run – were presumably in Category 3: they entered a smoking cessation program because of a second-order preference to quit but an actual (first-order) preference to keep smoking. They were counting on the intervention to fulfill their second-order preference (to change their actual preferences), but it could not. This probably often takes the form of believing the marketing promise that a course of NRT will eliminate the “craving”, when in reality it merely partially satisfies the craving temporarily without causing it to be gone when the NRT use ends. As a result, they either never became smoking abstinent (the large majority of study participants) or they resumed smoking before long (the large majority of those who became temporarily smoking abstinent during the experiment). Thus, extensive experimental evidence suggests that Category 3 is most common, and Category 2 is quite rare.

Some interventions that might be useful for Category 2, but offer almost no hope of changing preference ordering, are marketed as if they do offer such hope, taking advantage of the second-order desires of those in Category 3. Marketing for NRT often focuses on the message that “this will reduce your desire to smoke”, conflating temporary replacement of some of the benefits of smoking – possibly enough to get someone in Category 2 “over the hump” – with a long-term change in desires. This is an obvious

explanation for why most people who achieve short-term abstinence with NRT products resume smoking later.

A disconnect between very short-run preferences and medium- to long-run preferences, as in Category 2, is rare, yet many smokers are inappropriately assumed to be in this situation. This may be in part because of the plasticity of the ill-defined concept of “addiction”. The term is frequently used to refer to the reasonably well-defined property that is properly called dependence (i.e., subject to severe withdrawal symptoms that might make getting to the long-run equilibrium too difficult). A sufficient level of dependence will put someone who would be in Category 1 into Category 2. But “addiction” is often used much more broadly, to describe more common characteristics like an acquired appreciation, which describes most smokers in every category as well as aficionados of many benign behaviors like listening to music. Often “addiction” is merely demeaning political rhetoric used to refer to everyone who likes smoking or even just smokes. Some (failed) attempts to construct a formal definition for “addiction” distinct from dependence seem to be attempts to say “is in Category 3” (i.e., to say “wants to quit, but still wants to smoke”) though they often come closer to saying “is in Category 2, 3, 4, or 5” (i.e., chooses smoking over not smoking, for whatever reason). Thoughtless or politically-motivated conflation of different meanings for the word naturally creates confusion.

The few interventions that seem to be effective for converting someone in Category 3 to a nonsmoker include strong drugs that eliminate the net benefits from smoking or physical situations that dramatically raise the costs of smoking (e.g., pregnancy or medical conditions; regimented situations where smoking is banned, such as imprisonment or military enrollment). However, these seldom magically create a nonsmoking version of the smoker that permanently loses the ability to benefit from smoking or forgets those benefits. A long period of abstinence might permanently change someone’s preference ordering, but in many cases the desire to smoke remains and is either a constant source of welfare loss or is acted upon. Moreover, if an intervention could permanently lower the benefits of smoking (e.g., (25)) it would create a serious ethical question, since most people in Category 3 really want to increase the net benefits of nonsmoking rather than lower the net benefits of smoking, even though they may not realize this.

This suggests that the best option for many in Category 3 is to migrate into Category 4. Once they understand that their desire to quit is second-order, and that they are really looking for a way to prefer not smoking to smoking, finding ways to quit without the reduced net benefits from abstinence is the obvious strategy. Anti-tobacco extremists try to discourage tobacco harm reduction by misleading people into believing that the alternative products are not substantially less harmful than smoking and other falsehoods (26-29). But a second and perhaps equally important anti-THR tactic has been largely overlooked: By successfully convincing the bulk of smokers who are in Category 3 that they are really in Category 2, and thus just need a bit of help from “approved” cessation methods, these activists discourage them from attempting the one method – switching to an alternative product – that might work for them. For most of the history of THR promotion efforts, a common response of smokers to a recommendation of switching to a

low-risk alternative has been “I don’t need that because I am just going to quit soon,” which is unfortunately recited mostly by smokers who do not actually quit soon. Part of the success of e-cigarettes is probably that the celebratory culture that surrounds them has broken many Category 3 smokers out of this socially-constructed dead end.

Category 4 stands apart from the other three. Someone in that category feels that THR is desirable, though they may not realize it is an option, and presumably are just waiting to learn that it is an option or find the right alternative product. However, adoption of THR is also a promising option for someone in the former three categories. Someone in Category 3 may not come to the understanding that she really prefers continuing tobacco use to abstinence, but still might be convinced to use a low-risk alternative instead of continuing to smoke; she might have a latent preference for THR (i.e., would prefer THR if she had full information). Indeed, many in Categories 1 or 2 (or 5, for that matter) might have a latent preference for THR. But in addition to that, someone in Category 1 might find that trying a THR product is the trigger event he needs, and someone in Category 2 might find it both a trigger and a way to avoid the short-term pains.

It is sometimes argued that THR is an inferior choice for someone in Category 1 or 2 who genuinely prefers abstinence. Implicitly claiming this, with the ancillary implicit claim that most smokers are in those categories, seems to be the basis for a lot of anti-THR advocacy. (“Seems to be” because anti-THR arguments are typically vague, and people making them have seldom even thought through the premises their claims are based upon (30).) However, the claim that THR is inferior even for those in Category 1 or 2 is dubious at best. THR can be welfare-enhancing for someone who prefers abstinence to smoking; she may still prefer use of a low-risk product (all costs and benefits considered) to abstinence. Moreover, the argument is dubious even when considering only the net health effects and ignoring all other preferences: THR now does not preclude abstinence later and is quite likely to cause it to happen sooner, and the health benefits of quitting smoking a few months sooner exceed the estimated health costs of a lifetime of low-risk product use (31).

Interpreting cessation method studies in light of these observations

Referring to a particular method as “better” or “best”, without proper conditionals (e.g., “best if being used as a forced intervention for a randomly selected individual” or “better for individuals who have a genuine first-order preference to be abstinent”), is a misguided statement.

It is sometimes erroneously claimed that unaided quitting works better than any quitting aid because it is the method that accounts for most cases of long-term abstinence. However, when we observe that smokers in Category 1 are the most likely successful permanent quitters, and that they have no particular reason to use a method other than unaided quitting, it becomes apparent that the data is far too confounded to support any such claim. Comparison of the probability of success of unaided quitting is further complicated by recall bias: An unsuccessful unaided quit attempt is easily forgotten or dismissed in retrospect as not “real”, whereas an aided attempt will be remembered as a concerted effort.

Because of obvious self-selection, the Rodu-Phillips and Brown results cannot be interpreted as showing that THR switching is more effective than other smoking cessation aids. Smokers who are aware of the advantages of THR and actively desire to switch are far more likely to try. Few people would describe their first few tries of a low-risk tobacco product as a smoking cessation attempt. A concerted cessation (switching) attempt would seldom occur until the smoker had tried alternatives and identified one as appealing. Thus, those who make serious attempts to switch products are highly self-selected as those who are likely to succeed at that switch. Of course, this does not diminish the benefits of successfully switching or the absolute number who successfully quit that way, but it makes it impossible to extrapolate the results to predict a population average success rate if the method were attempted by everyone.

Associations that are misinterpreted as showing a particular assistance method actually *lowers* the chance of successful quitting (e.g., (3)) almost certainly reflect selection bias. While temporarily chewing nicotine gum will help only some of the few people in Category 2 and just be a hollow promise for the majority in Category 3, it is difficult to see how trying it could possibly cause a would-be-successful cessation attempt to fail. However, if those who use aids to help them quit are biased toward Category 2 or 3, rather than 1 (as is almost certainly true), a negative association between successful cessation and use of the aid will be observed.

Interpreting command interventions (clinical trials) is somewhat different. In keeping with the medical industry perspective, such interventions require highly structured therapeutic interventions, validate smoking as a “disease”, and treat the people involved as generic objects to be manipulated rather than individuals with heterogeneous preferences and volition. These experiments would have informational advantages if these medicalized perspectives of smoking were accurate. However, the flexibility inherent in some cessation methods, particularly THR, is largely lost if the participants are presented with limited product options and a regimented timeframe, as is almost inevitable in experimental settings. Moreover, the success of THR is strongly dependent on the social support of those who have already done it, and who are often the motivators for real-world switching attempts. Command interventions will tend to favor inflexible, non-social methods like NRT, whose effectiveness is not diminished by the medicalized setting. Thus, the Bullen result should not be interpreted as showing that THR is not much more effective than NRT, but rather that the inflexible, minimally supported provision of one particular THR product is not much more effective.

On the other hand, volunteers for a particular study may self-select based on interest in the intervention that is advertised. In the case of NRT this might matter little because it does not fulfill its promises. However, for a trial that explicitly includes a particular THR product, volunteers might already be considering switching to that product, or might be seeking the imprimatur of a clinical setting to make them feel better about it. This could explain the very high switching rate observed by Caponnetto et al. (2013) (32).

In any case, no command intervention study can be interpreted as generalizing to real-world decisions of free-living people who are not self-selecting to participate in a study. Worse still are trials that measure the wrong endpoint, particularly complete tobacco/nicotine abstinence rather than smoking abstinence (i.e., that label successful smoking cessation via THR to be a failure), as well as those that only measure short-term abstinence and fail to follow up long enough to judge whether it could legitimately be called cessation. Even when there is a snapshot of temporary abstinence at a longer time after the experiment, it will tend to over-count cessation by missing intervening periods of smoking, and there is almost never an attempt to apply enough medium- and long-term measures to avoid this (as was done in Tilashalski et al. (2005) (33)).

Conclusions

There are an enormous number of studies of smoking cessation methods, and a new wave that includes e-cigarettes has begun. However, these seem to play the role of Rorschach test rather than aid to useful policy and education, or perhaps the “support, not enlightenment” role of the lamppost for the inebriated. They are interpreted as supporting the observer’s political bias about cessation methods, which may be based on other empirical observations or mere ideology. Even attempts at unbiased observations suffer from a failure to understand that the study of consumer preferences differs dramatically from medical treatment research, and must be interpreted with the eye of a social scientist.

Consideration of the different categories of smokers presented here is crucial to both an informed interpretation of research and useful advice for smokers. Methods to aid smokers to understand their true preferences, and thus what might be a desirable quitting approach, follow naturally from these observations, particularly helping smokers to reflect on their motivations and desires. Standard methods for categorizing smokers or including covariates in studies can help discriminate among these categories of would-be quitters, but are likely to only be useful if explicitly interpreted in that context. For example, intensity-of-desire variables, like the standard “how soon after you wake up do you have your first cigarette”, might be used to identify subjects who are more likely to be in Category 1 rather than one of the other categories and thus allow better interpretation of the data. Blindly throwing those variables into statistical models without such structure, however, is unlikely to be particularly informative.

Unbiased and thoughtful interpretation of smoking cessation study results could provide much useful information about how to advise smokers who want to quit. But very little of that seems to be occurring. If helping people who want to quit, or want to want to quit – rather than just generating revenue or rhetoric – is the goal of the research, then some more serious attention to the nature of the phenomena being studied is in order, with smokers seen as consumers with first- and second-order preferences that drive their behavior, rather than as patients with an illness for whom assigning a cure would be appropriate.

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