

OPPORTUNISTIC PLANNING AND FREUDIAN SLIPS

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Freud's study of the psychology of errors (see, e.g., Freud, 1935), including notably "slips of the tongue," led him to the conclusion that many such errors are not merely the result of random malfunctions in mental processing, but rather are meaningful psychological acts. That is, they are *intentional* actions in every sense of the word, reflecting and indeed *carrying out* the goals, whether conscious or not, of the person who commits them. In particular, Freud argues, such errors stem from attempts to carry out *suppressed* intentions, intentions which have been formed but then in some sense withdrawn because they conflict with other, more powerful intentions.

For example, in the simplest case a person may decide to say something, but then change his mind and decide to say something else instead. Nevertheless, the original intention somehow intrudes itself into his utterance. Freud (1935) discusses the example "Dann aber sind Tatsachen zum Vorschwein gekommen," ("and then certain facts were *revealed/disgusting*"), in which *Vorschwein* is a conflation of *Vorschein* (revealed) and *Schweinereien* (disgusting). The speaker relates that he had originally intended to say that the facts were disgusting, but controlled himself and decided to say something milder instead. In spite of this decision, however, the suppressed intention apparently exerted an influence on his speech.

Examples of this sort show that goals, once formed, can influence subsequent behavior despite intervening decisions to suppress them. Viewed from an information processing perspective, however, there are two radically different interpretations of this fact, corresponding to two distinct models of how the influence might be exerted. On one account, no further processing of the goal is undertaken after its suppression, and the influence is simply a residue of the processing that took place prior to that suppression. In the above example, for instance, it may simply be that the prior contemplation of the goal to say the precise word, "Schweinereien," activated that word in memory, and that this residual activation had an effect on the process of choosing what words to say, thus causing the slip. On this account, although the slip does in some sense *reflect* the suppressed goal, it is not really an attempt to carry out the goal.

However, more complex examples show that this sort of residue explanation is not, in general, adequate. Consider Freud's example of the toast "Gentlemen, I call upon you to *hiccough* to the health of our Chief," in which the word *aufzustossen* (hiccough) has been substituted for the word *anzustossen* (drink). In his explanation, Freud argues that this slip is a manifestation of an unconscious goal on the part of the speaker to ridicule or insult his superior, suppressed by the social and political duty to do him honor. However, notice that in this case, in contrast with the simpler example above, one cannot reasonably expect that the speaker's intention to ridicule his superior gave rise originally to a plan involving the use of the word "hiccough." That word can only have been chosen in the course of attempting to retrieve the consciously intended word "drink," to which it bears a close similarity in German. Yet, if we accept Freud's analysis of the example, the word "hiccough" was selected because it achieves the speaker's goal to ridicule his superior. Thus we are forced to conclude that this goal was still

active during the attempt to retrieve the word "drink," *despite the fact that it was suppressed prior to that attempt.*

The mere fact that suppressed goals are able to affect the overt behavior of planners is enough to justify the assertion that they are active. However, the sense of *activity* implied by examples like the above transcends this ability alone. There is no way that a planner could have reasonably anticipated that the goal of ridiculing or insulting its superior would be satisfied by uttering the word "hiccough." If for no other reason, this is because there are hundreds of *a priori* more plausible words and phrases that can be used to insult or ridicule someone. However, if the planner was not looking for *this opportunity in particular*, then it must have been looking for *any opportunity in general*. In this case, recognizing the opportunity involved realizing that the substitution of the word "aufzustoßen" (hiccough) for the word "anzustoßen" (drink) would, *within the context of the toast*, result in a ridiculous and insulting utterance. Because the effect of the substitution depends on the context, considerable inference is needed to determine whether it would, indeed, serve to carry out the goal of insulting the superior. Thus, the planner must have expended considerable cognitive resources in checking potential opportunities from the time of the goal's formation to the time that this particular opportunity in fact arose.

But why would a planner expend such resources on a goal *which it had already determined not to pursue*? In fact there is no coherent way to view the planner *as a whole* as the agent behind the expenditure of cognitive resources in the pursuit of suppressed goals. What examples like the above seem to indicate, therefore, is that the goals *themselves* are active cognitive agents, capable of commanding the cognitive resources needed to recognize opportunities to satisfy themselves, and the behavioral resources needed to take advantage of those opportunities. In a very real sense, such goals must be actively *observing* the mental processing being carried out for other goals, not only inspecting features of that processing, but also drawing inferences about how those features might be useful in their own satisfaction. They are not merely, for example, data structures in some monolithic planning system, which could be trivially suppressed simply by being erased or marked as inactive. They must be actively suppressed, and such suppression may in fact fail.

We now come to the central question of this paper: Is the conception of goals and goal processing needed to explain Freudian slips functionally justifiable, or does it merely reflect an accidental attribute of human psychology?

Fundamental to the above explanation of Freudian slips is the ability to recognize and seize opportunities. In Birnbaum (in press), it is argued that this ability is a fundamental element of intelligent planning in general. To take a simple example, suppose you go to the store to buy something. If, while you are at the store, you notice an item that you want on sale, you may then decide to purchase the item, even though you did not originally go to the store in order to satisfy that intention. The point here is that it is not, in general, possible to foresee all the situations in which an unsatisfied goal may be satisfiable. Intelligent behavior requires the ability to recognize and seize such unforeseen opportunities to satisfy goals.

As we saw in the case of Freudian slips, recognizing opportunities may entail significant inference. This is particularly true if we consider people's ability to seize *novel* opportunities. It is easy enough to suppose that some features of situations would point directly to goals that they satisfy. For example, it is arguable that, indexed under the feature "money," we have the goal of possessing money. Thus, it isn't hard to see how the opportunity implicit in seeing some money on the street would be recognized.

On the other hand, suppose a person goes to a hardware store and sees a gadget he did not previously know existed, e.g., a router. People seem perfectly capable, at least sometimes, of

constructing the inferential chain necessary to recognize how such a novel opportunity might facilitate the achievement of a goal that they could not, ahead of time, have known that it would facilitate. For example, someone who had the goal of possessing bookshelves would seem perfectly capable of realizing that a router would be useful in building them. This seems plausible even if he had not intended to build the bookcases, but rather had intended to buy them. In that case, he probably wouldn't have given much thought to how they might be built. But, once he understands what a router does, he may realize that it can be used to cut channels in the side boards of the bookcase, into which horizontal boards can be fitted as shelves.

While the need for this kind of opportunistic processing provides us with a functional justification for the ability of a goal to recognize the means for its own accomplishment when they unexpectedly present themselves, it remains to be explained why goals which have for good reason been suppressed should be able to overcome their suppression when opportunities for their achievement arise. That is, why should an intentional system lack the means to deny such a suppressed goal access to mechanisms for producing real behavior?

Surprisingly, it turns out that opportunistic processing even offers a functional justification for this seemingly unproductive characteristic of an intentional system. Consider first what it *means* for a goal to be "suppressed." A goal would need to be suppressed if it were found to be in *conflict* with another goal in the system. There are two ways that a goal conflict could arise: either because the goals themselves are inherently mutually exclusive, or because some rather more contingent problem arises in attempting to plan for both of them. That is, it might be that two goals are found to be in conflict based on the planner's judgment of the resources and options available under the circumstances in which the goals are being weighed. (See Wilensky, 1983, for an analysis of the considerations involved in making such judgments.) For example, the goal of insulting one's boss is presumably suppressed because it conflicts with more important social and political goals. However, the conflict between these goals is situation-dependent. It is perfectly possible, albeit unlikely, that there may be some future situation in which insulting the boss and achieving one's political ends would be compatible.

Once a goal conflict is recognized, a planner must decide to suppress one goal and pursue the other based on an assessment of which course of action is most reasonable in light of current or expected future circumstances. However, it is quite possible that in fact future circumstances will be different than originally foreseen. Thus an opportunistic planner must be able to override previous decisions about which of its goals to pursue. Decisions made when formulating the plans currently being pursued should not be immutable.

Consider the following example. Suppose a person is out in the forest and is both hungry and thirsty. Given his knowledge about food sources and water sources, and whatever other pragmatic considerations pertain in the circumstances, he decides that these two goals conflict, and that he will suppress the thirst goal while he pursues the aim of satisfying his hunger. While pursuing his plan to obtain food, however, he comes upon a stream which he hadn't previously known about. This is precisely the kind of situation in which we would expect -- or, indeed, demand -- an opportunistic response, regardless of any previous decision to suppress the thirst goal.

The implication here is that the decision to suppress a goal is really just a decision to forego planning for that goal, and that *in an opportunistic processor, no goal is ever really "suppressed."* Viewed in this light, the fact pointed to by Freudian slips, that goals which have putatively been suppressed can still take advantage of opportunities for their own achievement, can not only be understood, but can be seen to be a desirable and possibly necessary aspect of a planner.

What yet remains unexplained, however, is why opportunities would be acted upon even when further reflection by the planner would presumably reaffirm the decision to suppress them, as is undoubtedly the case with Freudian slips. It would seem somewhat counter-productive not to demand that the planner be allowed to reconsider the reasons why a goal was suppressed, in light of the sudden appearance of an opportunity to achieve that goal. We might expect, for example, that despite the opportunity to insult or ridicule one's boss, this opportunity would not be taken, since it would still be impolitic to do so. We might, in fact, assume that this is often what happens. In the case of the hungry and thirsty person, for example, it would make sense for that person to reconsider why he thought there was a conflict between those goals upon finding the stream.

There will not always be time to do this, however. The fortuitous presence of a rock or stick, for example, noticed in the course of a struggle with an animal, is an opportunity which would have to be seized virtually without thought to be helpful. Thus, we might expect that when there is severe time pressure in deciding whether to pursue an opportunity or not, action can be taken without due consideration by the planning mechanism as a whole. Lexical selection, while lacking the life-or-death implications of struggles with predators, is nevertheless a process which must occur in split-seconds to produce smooth vocalizations. We might, therefore, view Freudian slips as an unfortunate but unpreventable side-effect of the need for this kind of opportunistic short-cut to behavior.

In conclusion, we have argued that in order to accept Freud's intentional explanations for slips of the tongue, we must postulate that goals are active mental agents, commanding the cognitive resources needed to recognize opportunities to satisfy themselves, and capable of acting on such opportunities even when suppressed or unconscious. We have further shown that such a conception of goals can be functionally justified on the grounds that it fulfills the requirements of opportunistic processing. In particular, we have seen that the ability of such goals to manifest themselves even after their "suppression" is not merely a flaw in human beings, but is a necessary attribute of an adequate opportunistic processor. Thus, it seems that the kind of intentional machinery needed to support opportunistic planning would quite naturally exhibit Freudian slips.

References

- Birnbaum, L. (in press). The role of opportunistic planning and memory in arguments. Submitted to *Cognitive Science*.
- Freud, S. 1935. *A General Introduction to Psychoanalysis*. J. Riviere, translator. Liveright, New York.
- Wilensky, R. 1983. *Planning and Understanding*. Addison-Wesley, Reading, MA.