PERCEPTION OF INTOXICATION EFFECTS ON SPEECH

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Abstract: The question can be asked: is it possible to determine if a person is intoxicated by observing his speech and voice? Closely related questions are: can talkers, especially actors, effectively mimic the speech of intoxicated individuals and can they volitionally reduce the speech degradation that results from this state? To assess these questions, auditors were tasked to judge if actors sounded more inebriated than they actually were when simulating it and if they sounded less intoxicated (than they were) when attempting to sound sober. Young, healthy actors, chosen on the basis of a large number of selection criteria, were required to produce several types of utterances: 1) during a learning phase, 2) when sober, 3) at three simulated levels of intoxication, 4) during actual, and parallel, levels of controlled intoxication, and 5) at the highest level of intoxication but when attempting to sound sober. Forty listeners were used as judges. It was found that they rated the speakers as being more intoxicated when sober, but simulating drunkenness, 88% of the time. They also judged them as sounding less inebriated (than they were), when attempting to sound sober, 61% of the time.

INTRODUCTION

Determination of the presence, and especially the level, of intoxication being experienced by a human is a challenging task. It is often complicated by the fact that these decisions can be made only on the basis of the listeners' perception of the talkers' speech and voice. Some research has been carried out in this area but few correlations have been found. Indeed, many questions about the speech-intoxication relationships still exist. One area where numerous misunderstandings and confusions occur is related to the ability of humans to control the cited relationships. For example, can people mimic drunkenness when they are sober and sobriety when they are intoxicated? The significance of these issues is of rather substantial importance to the many types of professionals (clinical, law enforcement, family, supervisors, bartenders, and so on) who interface with intoxicated individuals.

METHOD

The present project was structured in a manner that permitted the two cited questions to be addressed. Speakers were 12 young, healthy actors selected from a large pool of volunteers on the basis of acting competency, drinking patterns and general/medical status. They were required to produce four types of speech; however, only samples of orally read material (selected from that data-base) were used in the present research. The speech sample was produced for nine separate experimental conditions; they were: 1) familiarization, 2) sober baseline, 3) three conditions of simulated intoxication (mild, "legal", severe), 4) three conditions of actual intoxication (BrAC 0.04-0.05, 0.08-0.09 and 0.12-0.13) and 5) a "sounding sober" condition when the subject actually was at BrAC 0.12-0.13. All experimental conditions were rigorously monitored.

Listeners were 40 young, healthy university students who could demonstrate that they had normal hearing. They were presented two pairs of each subjects' utterances (order counterbalanced; position randomized); the task was to specify the one for which they thought the talker sounded more intoxicated. In the first experiment, an instance when the actors were simulating "severe" intoxication was paired with another where they actually were experiencing that state. The second study involved contrasts of the talkers' speech when he or she attempted to sound sober (but was severely intoxicated) with prior samples produced when actually intoxicated at that level.

RESULTS

A summary of the results of both investigations will be found in Table 1. As stated, the first study
(A) was focused on the ability of actors to sound intoxicated when they were not. As can be seen, they were quite successful in doing so. Indeed, auditors judged the simulated state to "exhibit greater intoxication" over 88% of the time. With this relationship statistically significant at the p<0.01 level, the first of the two questions could be answered in the affirmative. Moreover, while there appeared to be slight gender and order effects, neither were significant. However, some variability was observed among the performances with three of the actors accounting for nearly all of the negative values. The data are judged to be of import in the sense that most of these subjects -- and probably many non-actors as well -- are able to sound drunk when they are not; certainly a problem for counselors, clinicians and law enforcement personnel, if not others.

Table 1. Summary table of the perceived speaking contrasts for the actor-subjects. In both experiments, 40 listeners judged which of a pair of samples contained utterances where the speaker sounded the most intoxicated. In the first case, the contrast was between simulated and actual severe intoxication; in the second, it was between samples which were both produced while the speaker was severely intoxicated. However in one of them, he or she attempted to sound sober. All values are in percent.

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Experiment A</th>
<th>Experiment B</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Intoxicated</td>
<td>Simulated</td>
</tr>
<tr>
<td>Males (N=7)</td>
<td>12.5</td>
<td>87.5</td>
</tr>
<tr>
<td>Females (N=5)</td>
<td>11.3</td>
<td>88.8</td>
</tr>
<tr>
<td>Mean (N=12)</td>
<td>12.0</td>
<td>88.1</td>
</tr>
</tbody>
</table>

The second study (B) was designed to determine if actors could convince listeners that they were not intoxicated when they actually were; for these results see again Table 1. As can be seen, the speakers were found to sound sober (or, at least, less intoxicated) than they actually were when they attempted to do so; they were successful 61% of the time. Again, the slight gender and order effects proved not significant. On the other hand, the overall data here are a little more variable than those in the first experiment and four of the subjects (not three) departed from the trend. Even though the relationships here are far from universal, the fact remains that many actors -- and undoubtedly numerous other people -- can sound significantly less intoxicated than their actual condition would warrant. Under-estimation of high levels of inebriation can be of substantial importance to individuals who must deal with, and/or control, individuals of this type.

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