

By Tom Nousaine

Urban Audio Legends

Some of the most ridiculous notions get popularized both on the street and in the press. You know what I mean: coffee should always be made from cold water, cold water boils faster than warm, hot water freezes more quickly, etc. Their staying power is nothing short of amazing. When it comes to audio, Urban Legends are bountiful. You know: green rings painted on the edge of your CD improve the sound, etc. I believe there are some specific mechanisms that help launch Urban Audio Legends and give them remarkable longevity.

Anyone who has ever heard a phantom image, sound coming from a location where no sound is being made, knows that audio reproduction is magic. Like the first trick at a magic show, the mere demonstration of stereophony, in and of itself, helps establish a willingness to suspend disbelief. Unfortunately, with audio the audience is encouraged to remain in suspension following the show. I think we are maximally susceptible to suggestion because we already know audio is magic when we start.

People are also quite prone to "overdetect" (thanks to Jim Johnston of AT&T Labs for the term) differences in sound. My own work shows that people will routinely describe differences in sound quality, often in great detail, when given two identical sound excerpts. They also confuse small differences in loudness with quality changes. In my experiment, subject preferences were strongly influenced by inserting a 1-dB loudness difference. But—no subject ever mentioned level change

as a differentiating factor in either written or oral comments. Not surprisingly, the strength of the loudness effect was roughly doubled when the louder of two alternatives was given last.

This may explain the typical hi-fi demo sequence. The host, be it your best friend showing off his new amplifier or electronic show-booth attendant or salesman at your local high-end salon, always demonstrates the more desirable (to him) product last and he always turns the volume control all the way down between switches, maintaining control of subtle loudness differences that play to his advantage. The process is particularly useful if the salesman doesn't consciously possess knowledge of what's happening. The technique just sells product and doesn't require examination of conscience.

Human decision-making style also promotes Urban Legend making. We are strongly disposed to choose, and we tend to make quick decisions, with perhaps only 5 to 10% of data available. When in our evolution we were still knuckle draggers, running now and finding out it was a real tiger later was a very good strategy. Because of the huge number of evaluative decisions required in modern life, this habit certainly makes life more manageable, especially if the decision has a low cost. You can't go very far wrong choosing laundry detergent that way.

However, research shows that people tend to make purchases of big-ticket items, such as cars, houses and wives, in a like manner and that we are often incredibly decision-re-

tentive. Having made a decision, we will sometimes reject even overwhelming contrary evidence. Once you convince someone he really "heard" that cable—and that isn't hard to do—it may be difficult for anyone to change his mind later.

A good example of this is the wishful-thinking data analysis of a certain capacitor experiment published in a British hi-fi magazine about 15 years ago. In a recent Usenet post the experimenter said, "In case Mr. McC. hasn't performed any blind tests, in the January 1986 issue of Hi-Fi News I reported the results of blind listening tests that showed *identification by ear* of the difference between an electrolytic capacitor used as a series highpass filter and a same-measured-value cap with a polypropylene dielectric." (Emphasis mine.)

With a little digging, I came up with a copy of that report and found the results showed that, in a single blind test, listeners were able to correctly identify a 2.2 μ F electrolytic or film capacitor against a straight-wire bypass just a shade under half the time. That's right, between 49 and 50% correct responses. The test results were clearly null.

This was a large experiment with over 300 subjects and more than 2000 trials, so there was a lot of data to dredge. The claimant felt that there was evidence that "slight" identification could be seen when the experiment was analyzed according to music program, and in his opinion the electrolytic capacitor had a subtle but definite effect. While it was true that three music selections did appear to have statistically significant results when analyzed by themselves, deeper investigation revealed the one particular piece, said by the experimenter to have an abundance of low-frequency information and therefore more resolving power, had

apparently significant results for *both* the film and electrolytic capacitors.

However, for the electrolytic the results were significant in reverse. That is, the subjects incorrectly identified the capacitor as a piece of straight wire over 70% of the time. This was the most strongly significant result and a clear indication that some kind of procedural bias was present during the experiment, not evidence that people could hear capacitors. Even if one were to accept that these results have meaning, they are contrary to those claimed; the positive results for the film capacitor should have been thought to demonstrate it was more audible.

Of course, on the whole, the data strongly suggested that neither capacitor could be distinguished from a wire bypass. Even the 1986 report called for additional listening tests. Yet 15 years later the experimenter, without qualifying his comments and apparently not having conducted follow-up listening tests, was willing to unambiguously state that the report showed "identification" by ear.

Remembered results often grow in importance over time when one needs "a reason to believe." (Rod Stewart singing in the background.) This case clearly shows the human tendency to reject negative evidence once a decision has been made, which, in this case, seems to have occurred before the experiment was conducted.

Of course, a scientific experiment should establish a falsifiable hypothesis—capacitor dielectric has a sound quality quotient—and then design an experiment to show that this is true, or not. In this case the hypothesis was not confirmed by the experiment, and the experimenter just dredged the data to find and select bits that seemed to "confirm" the hypothesis, while ignoring the rest of the evidence.

Let's also discuss a powerful marketing procedure that enhances sales and plays to Urban Legends. A number of years ago I was required by my employer to visit 25 shareowners every year, in addition to my regular duties. Armed with a list of shareowner telephone numbers, my initial success rate with actually arranging an appointment was less than 10%. People just weren't inclined to agree to do this.

Changing the telephone technique from "Will you meet with me?" to "I have 11:30 next Tuesday and 8:45 Thursday available for our visit—which works better for you?" improved my success rate to around 70%. People were perfectly willing to choose between alternatives, even when they hadn't already said "yes" to the original question. This technique works on the assumption that you have already agreed to the lower-level question.

That's why salesmen never ask, "Do these sound different?" They always ask, "Which one sounds best?" A simple technique which carries an assumption that you have already agreed they *are* different. Have you ever been to an audio demonstration where spoken comments were "they sound the same to me"? Think about it.

On the other hand, sometimes an Urban Legend hangs on because it just seems logical on its face. You've heard the old saw "You can't get low bass in a small room." This one seems logical at first glance. That's partially because most people have only heard what they consider to be low bass in a large place (organ in a cathedral) or outside (at the airport). But they don't stop to consider that you can still hear recorded bass with headphones or in a car. (The "fast bass" legend is probably another of the apparently logical types.)

So we have two classes of Urban Audio Legends. Type 1 is a function

of normal human behavior, often supplemented with good merchandising technique. The other simply comes from a simple mistake of reason. I bet many are a combination. Which of these Urban Legends began as a Type 1 or Type 2 Urban Legend error?

Urban Legend:

1. Fancy parts improve sound (capacitor dielectric, DACs, etc.).
2. Fast bass (small woofers are more linear than big ones).
3. Rhythm and pace (a playback component can change tempo).
4. Low bass is impossible in a small room.
5. Fancy cables improve sound quality.
6. Non-audio tweaks improve sound (change placed on the speaker, tiptoes, green ink, at al.).
7. DVD players sound inferior to CD players.
8. LP sounds better than CD.
9. Data reduction always lowers sound quality.
10. Small amplifiers burn out tweeters.
11. Equalization is bad.
12. Negative feedback is bad.
13. Short signal paths are good.
14. Multichannel is a step backward.
15. Auto sound is bad.
16. Film sound is bad.

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As an addendum, let's discuss the semiannual Recommended Components List of a certain prominent audio publication. You may recall that the letters section of that magazine claimed, and the general consensus was, that Julian Hirsch of the now defunct *Stereo Review* "never met a component that he didn't like." Of course, this was partially a product of *Stereo Review's* policy, at that time, not to publish negative reviews. In that framework the policy was to avoid wasting copy on turkey

products. Pretty reasonable, in my opinion.

So let's examine the Recommended Components List of that other still thriving audio publication. The cover boasts the list contains 700 products. Earlier issues say the magazine reviews roughly 150 products per year. The Annual Index for 2001 contains approximately 160. The preamble to the list says that a product gets removed from the list if no one on the staff had listened to it in three years, or if the product is discontinued.

Let's dredge some data. Seven hundred components at 150 per year means that either the list contains a lot of very old components or . . . they seldom meet a product they don't like. Finer investigation shows that all 18 of the power amplifiers reviewed in 2001 appear on the RCL published in 2002. While all of them may be quite useful devices, it seems that this magazine had never met a power amplifier they didn't like. Let's further examine the statistics: the magazine reviews 150 products a year; the RCL contains 700 products; and things that haven't been listened to in three years, or have been discontinued, are dropped. So we arrive at a list of 700 products, which was culled of 100 for the latest RCL, which then has to contain roughly every product reviewed in the past four to five years. This seems to imply that this publication has seldom met a product it didn't like or wouldn't recommend. Sounds a lot like the old *Stereo Review*, doesn't it? TAC