

Anticipated versus actual reaction to HIV test results

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The accuracy of predictions of how people will react to a medical test result is important because it may influence the decision to be tested. We hypothesized that people would overpredict their own long-term reactions to HIV test results (i.e., that they would feel better in response to seropositive results and worse in response to negative results than they expected to). In the first study phase, anticipations of reactions to positive and negative HIV test results were obtained from 50 subjects. In the second phase, postsuit reactions were obtained about 5 weeks after subjects learned the results of their tests. The results suggest that people anticipate more distress given a positive result and anticipate less distress given a negative result than they experience. Cautions about the comparability of the 2 samples and recommendations for further research are discussed.

The psychological effects of HIV test result notification are an issue of great concern. A common perception of the general public, and often of health professionals, is that notification of HIV seropositive status is detrimental to psychological health, leading to great distress, depression, and possibly suicide. Fear of such a powerfully negative reaction to a positive test result seems to be an important factor that causes people at risk to decline or delay testing for other conditions (Mastromaro, Myers, & Berkman, 1987).

Because people's expectations of their own emotional reactions to test results influence the decision to be tested, it would be interesting to know whether such expectations are realistic. Although the psychological impact of seropositive status has been studied, no studies have examined whether people who seek HIV testing can accurately anticipate their emotional states after notification of HIV status.

The impact of HIV status notification on emotional state over time has been studied. Perry and colleagues (Perry, Jacobsberg, Card, et al., 1993; Perry, Jacobsberg, Fishman, et al., 1990) examined the impact of serological status on psychological state in a sample of at-risk subjects who volunteered to receive an HIV test. The emotional state of these

subjects was assessed before, immediately after, and at 2 weeks, 10 weeks, and 1 year after HIV status notification. A majority of subjects demonstrated a high degree of anxiety before receiving their test results, and those who tested negative showed almost immediate relief on learning of their seronegative status. Seropositive subjects were anxious at the time of notification, but by 10 weeks later were much less anxious. At the end of the year, psychopathology was found to be predicted by initial psychological state and by a variety of other characteristics, but not by HIV status.

Moulton, Stempel, Bacchetti, Temoshok, and Moss (1991) examined the impact of HIV testing on a sample of homosexual men and found that distress was reduced in men who had incorrectly thought they would test HIV positive. Distress *did not increase* in seropositive men who incorrectly thought they would test HIV negative. Moreover, seropositive subjects showed less hopelessness and distress than did a cohort of nonnotified controls (who agreed to be tested but did not want to be notified). Both seronegative and asymptomatic seropositive subjects reported lower levels of psychological distress than symptomatic seropositive subjects, suggesting that psychological distress was more closely related to symptoms than to knowledge of HIV status.

Similar findings have been obtained in studies of predictive testing for delayed-onset genetic disorders such as Huntington's disease (HD), a condition that is severely debilitating and then fatal and for which there is no treatment. The appropriateness of tests for HD and other fatal and untreatable conditions has been debated for many years. Health professionals are concerned that people at risk for HD will attempt suicide if they receive a positive test result. This thinking is based on observation of the suicide attempts of people symptomatic for HD.

At the time this research was conducted, the test for HD was based on an indirect method, identifying a marker rather than the gene. (The current HD test identifies the gene directly.) Instead of providing a definitive positive or negative result, the indirect HD test was either informative (increasing or decreasing the risk of developing HD from 50% to 95% or 5%) or uninformative (providing no new information about the risk of HD). At Johns Hopkins, Brandt, Quaid, Folstein, Garber, Maestri, Abbott, Slavney, Franz, Kasch, and Kazazian (1989) found that after a year's follow up there were no major disruptions in the lives of those who received notification of an increased risk. In Canada, a collaborative study between several HD testing centers found results similar to those of the HIV notification studies (Wiggins, Whyte, Huggins, Adam, et al., 1992). The majority of people tested were distressed at the time of testing. Once the test results were made known, those with a decreased risk made the most immediate improvement but after a

year's follow up, those with an increased risk also improved. Subjects who received an uninformative test result changed little from their initial state. In both studies, there was no evidence of increased distress, depression, or suicide as a consequence of increased risk.

The HIV and HD studies suggest that knowledge of one's disease status in the asymptomatic state does not generally result in distress, depression, or suicide. Although there may be initial reactions of distress and shock upon learning that the test result is positive, these effects appear to dissipate rapidly over time. In fact, based on the psychological measures used in these studies, those who received an informative test result (negative or positive) showed less psychopathology than those who declined notification of their test results or those who could not receive more informative test results. It appears that asymptomatic people cope well with the news that they are HIV or HD positive. However, there is reason to expect that people who choose to be tested are unaware of this fact, and specifically that they will tend to overpredict their own reactions to a favorable or unfavorable test result.

Research on self-predictions in domains other than medical testing suggests that people underpredict their own powers of adaptation. For example, Loewenstein and Frederick (1997) conducted a cross-sectional study in which they asked some subjects to rate the degree to which 12 different events (such as weight that they gained or the shrinking of the rainforests) had affected their well-being during the past decade and others to predict how 12 events that were matched as closely as possible would affect their well-being during the next decade. People generally expected future events to affect their own well-being more than had past events, as if they underpredicted their own ability to adapt. Loewenstein and Adler (1995) showed people an object (a coffee mug), told them that they would be given the object, and asked them to predict how much money they would need to be paid to part with it. They then gave subjects the mug and gave them the opportunity to exchange it for cash. Subjects substantially underestimated how attached they would become to the object. Although neither of these studies examined reactions to medical test results, both seem to suggest that there may be a systematic tendency for people to underestimate their own powers of adaptation.

Kahneman and Snell (1990) hypothesized that when people predict their own emotional reactions to events, they consider an instantaneous representation of the outcome and don't take adequate account of adaptation processes. In the case of HIV notification, they may form an image of how it would feel to receive news of an unfavorable test result, or they may construct an instantaneous representation of HIV that combines notification with debilitation and death and fails to take account

of the long period that often intervenes between these outcomes. Read and Loewenstein (1995) called this phenomenon time contraction and showed that it is partly responsible for a curious pattern of choice first demonstrated by Simonson (1990). Simonson found that when people make many repeated choices simultaneously, they choose much more diversity than when they make the same choices sequentially. In a typical study, subjects choose which of six snacks to eat in three successive weekly meetings of a class. Subjects in the *sequential choice* condition make each choice on the day that the snack is to be eaten; those in the *simultaneous choice* condition choose all three snacks on the first day. Typically, subjects who choose snacks each week choose the same snack on all three occasions, whereas those who choose all three snacks at the beginning choose two or three different snacks. Time contraction implies that people pay insufficient attention to the 1-week interval separating the snacks, so they overestimate the degree to which they would get tired of their favorite snack if they ate it on all three occasions. Consistent with time contraction, Read and Loewenstein (1995) showed that if the long time interval between choices is made especially salient, the desire for diversification is reduced. Applied to HIV test results, time contraction implies that, when asked how they will feel 5 weeks after getting a specific test result, people will pay insufficient attention to the 5-week delay and will underestimate the degree to which they will adapt to the news, whether favorable or unfavorable.

Together, these findings suggest that people may estimate correctly their initial reaction to the news of a positive or negative HIV test result but will underestimate their adaptation over time to that news. We therefore predicted that people would overestimate their long-term negative reactions to an unfavorable test outcome and overestimate their long-term positive reactions to a favorable test outcome.

INTENDED STUDY AND QUALIFICATIONS

We intended to conduct a two-phase study. In the first phase, we would obtain anticipated reactions to positive and negative HIV test results at the time of the actual HIV test at an anonymous testing site in Pittsburgh. The second phase would consist of the postresult reactions, obtained from subjects about 5 weeks after they learned the results of their HIV tests.

A condition of access to our sample was preservation of subjects' anonymity. We became concerned that it might be difficult to obtain postresult reactions from a sample of subjects who were anonymous to the experimenters and thus responsible for initiating follow-up. In fact, slightly less than half of these subjects were lost to follow up. Another

difficulty (happily) was that the seropositive conversion rate in Pittsburgh is fairly low,¹ and a single testing site would not provide a sufficient number of HIV-positive subjects. We consequently advertised for a second sample in local newspapers. This sample consisted of people who had learned the result of their HIV tests in the previous 4 to 10 weeks, or at least made that claim; from these we obtained postresult reactions of both HIV-positive and HIV-negative subjects, but no anticipations. As a consequence, our data consist of an anticipation sample obtained from one set of subjects before learning the results of the HIV test and a separate but not necessarily comparable postresult reaction sample.

No matter how interesting or provocative the data, it is important to realize that the analysis is based on two potentially noncomparable samples, so no definitive conclusions can be drawn. For subjects in the anticipation sample who did not complete the second phase of the study, postresult reactions and HIV status are unknown. Some of these subjects may have tested HIV positive and experienced so much distress that they were unable or unwilling to complete the postresult portion of the survey. In addition, the subjects obtained through the newspaper providing us with postresult data may have anticipated different reactions. These subjects were recruited from a different source, were probably tested at a different facility, and may have very different characteristics affecting their anticipated reactions. Finally, because the study was completely voluntary, even if our two samples are comparable, they may not represent the general population of people tested for HIV. This study is best viewed as an initial investigation pointing to some of the difficulties of research in this area, a development of a useful methodology for future work, and some interesting results—consistent with prior findings and theorizing—that require further verification.

METHOD

The study was conducted with the cooperation of the Pittsburgh AIDS Task Force (PATF) and the Allegheny County Health Department. PATF is a free, anonymous testing site operated at a single location in Pittsburgh under the auspices of the county health department. Additional support services, community education, and service programs are also provided by PATF. Testing usually occurs on a walk-in basis, although it is possible to make appointments for testing. Testing is completely anonymous. Those who present for testing are provided with counseling and a risk assessment at the time of the test; they return a week later to obtain their results. Less than 15% fail to return for their results. Records are kept based on pseudonym and ID number. When people came to PATF for testing, they were informed about our study. Flyers and a description of the study were placed in the waiting room; surveys were placed

right next to the sign-up sheet for testing, and the PATF staff member responsible for testing and risk assessment informed potential subjects about the study. However, researchers in our study did not interfere with the usual procedures of PATF; unless potential subjects expressed an interest in the study, researchers did not approach them. We did not count the number of people who came into PATF for testing but did not participate in the study. Over an 8-week period, 50 people who came to PATF for testing agreed to participate in the study.

If a potential subject expressed interest in the study, a researcher asked the subject to fill out a survey. A 21-item instrument containing standard items used to assess mood was developed. The survey was developed so that it could be administered either in person or over the phone. Subjects were asked to anticipate their reactions 5 weeks after learning their test result. There were two anticipation conditions: testing positive and testing negative. In both cases, subjects were asked to imagine that it was 5 weeks after they had learned their test result and that the result had been positive (or negative). Subjects then read the 21 statements and were asked the extent to which they believed they would agree or disagree with each statement. Subjects were also asked to provide their age, gender, and estimation of HIV risk and to indicate whether this was their first HIV test. Researchers noted whether the survey was completed before the subject received the risk assessment and HIV test from the PATF staff member, or after. The average duration of the entire survey was about 10 minutes, including explanation. The format and scale of items in the survey are presented in Table 1 and the survey items are presented in Table 2. Sample instructions are presented in Table 3. In the anticipation phase, a subject responded to all 21 items imagining that he or she tested positive and all 21 items imagining that he or she tested negative. The order (positive or negative first) was randomly assigned so that half the subjects completed the positive test result anticipation first and half completed the negative test result anticipation first.

After 20 subjects had been recruited, we decided to add an item to the end of the questionnaire. We asked subjects, "How likely is it that you are HIV positive? Please give a number between 0 and 100 where 0 means that there is no chance that you are HIV positive and 100 means that you are certain that you are HIV positive." Subjects were given the option of providing a number, or making a mark on a line, with marks ranging from 0 (*no chance*) to 100 (*absolutely certain*). At that point we also started to indicate on the form whether the subject had completed the questionnaire before or after the HIV test.

For participation in this phase of the study, subjects were paid \$5. To ensure anonymity, subjects were given ID numbers. To complete the postresult phase and to maintain anonymity, subjects had to call the researchers back after receiving their test results. To facilitate the callback, subjects were given a wallet-size slip of paper containing the study phone number, the subject's ID number, and a date 5 weeks from the day that the subject was tested. Generally, subjects received their test results 1 week after testing, and were encouraged to call the researchers back 4 weeks after that. We chose the name *Insight Study* so that subjects would have no reference to an HIV test on their callback slip of paper.

Table 1. Survey design.

In the anticipation phase, half the subjects were asked to imagine how they would feel 5 weeks after receiving a positive (unfavorable) HIV test result and to complete a series of 21 HIV-positive items of the form illustrated here. They then did the same for a comparable series of HIV-negative items. The other half of the subjects completed the HIV-negative items first. In the actual phase, subjects were asked about their feelings over the past 2 weeks, and the survey was administered 4-10 weeks after subjects learned of their test results.

Anticipation: HIV Positive

If my HIV test is positive, I will feel very happy about my life as a whole most of the time.

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree

Anticipation: HIV Negative

If my HIV test is negative, I will feel very happy about my life as a whole most of the time.

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree

Actual: 4-10 weeks after HIV test results

I feel very happy about my life as a whole most of the time.

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree

A cellular phone was used so that the researcher answering the phone could remain mobile and accessible most of the time. Of the 50 subjects participating in the prediction phase, 28 called back for the posttest actual phase, usually 4 to 6 weeks after receiving their test results. The posttest phase consisted of answering the identical questions, only this time about current feelings rather than anticipations. Subjects were given the option of completing the postresult survey over the phone or in person at PATF or Carnegie Mellon University (CMU). This part of the survey took about 5 minutes to complete, and subjects were paid \$20 for their participation. If subjects elected to complete the survey over the phone, they came into PATF or to CMU to pick up their payment. The survey design for this phase of the study is presented in Table 1 and items are presented in Table 2. The same general instruction set was used for all phases, and those instructions are summarized in Table 3. Early on, we re-

Table 2. Survey items

I feel very happy about my life as a whole most of the time
I feel at ease most of the time
I feel very sad or blue most of the time
I usually feel that there is nothing for me to look forward to
I feel nervous most of the time
I feel happy most of the time
I feel angry most of the time
I usually feel that I am a complete failure
I feel pleased most of the time
I usually feel dissatisfied with everything
I feel guilty about most everything that has happened to me
I feel worn out most of the time
I usually feel that I am being punished
I feel cheerful most of the time
I usually have great trouble sleeping through the night
I feel calm most of the time
I feel irritated most of the time
I feel afraid most of the time
I feel full of energy most of the time
I usually have great difficulty making decisions
I feel hopeful about the future.

ognized that we would need another source of subjects, given the sporadic flow of people into PATF for testing, because many people choose to be tested at other locations such as an STD clinic, the county health department, or the office of a private physician. We placed advertisements for subjects in the local papers, asking for people who had been tested in the past 4 to 10 weeks; we obtained 45 subjects claiming such testing with negative results, 21 with positive results. Toward the end of the study, we recruited and accepted only those who claimed to test HIV positive. (Of course, some may have lied to obtain the money, but given the anonymity of our subjects, we could not check out that possibility and have no reason to believe that it would result in systematic, as opposed to random, error.) Subjects completed the same postresult reaction survey that PATF subjects completed, either over the phone or in person, and were paid \$20 for participation. Subjects were assigned an ID number and anonymity was preserved.

ANALYSIS

Rather than attempt to base conclusions on 21 separate analyses, one for each item in the survey, we used principal components analysis to guide us in the selection of a smaller set of variables.² For convenience, the scales of positively worded items (*happy, at ease, calm*) were reversed so that all items were coded in the same—negative—direction. Higher scores denote more distress

Table 3. Instruction summary

General instructions for all question formats

The following questionnaire consists of a series of statements about feelings. For each statement, you will be asked to select the response that best describes the way that you feel. The possible responses are:

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree

Note that these responses give you seven options. If you are completely torn or have no opinion, you can respond *neither agree nor disagree*. If you agree, you can respond *strongly agree, agree, or somewhat agree*. If you disagree, you can respond *strongly disagree, disagree, or somewhat disagree*.

So, for example, if the statement that you read says:

The year is 1990.

You would pick *strongly disagree* and place a mark in the box beneath *strongly disagree*. However, remember that these questions are based on your feelings and there is no right or wrong answer.

Suppose that when you return for your test results, you learn that you tested HIV positive. Imagine that it is now about 5 weeks after you have learned that your HIV test is positive. Please select the response that best describes the way you feel about each statement. *Please pick out the one response in each group that you think you would choose about 5 weeks after you learned that you tested HIV positive.* Place a mark in the box beneath the response you picked. Note that these statements about your feelings are quite general, describing a mood over a period of time rather than a temporary mood, so that you do not have to be concerned with daily events that may affect your mood when you make these predictions.

Phone Administration

Script 1

Brief discussion of study and consent obtained

Experimenter: "Were you tested for HIV?" If yes, assign ID. If no, go to script 2.

When were you tested (how long ago)? _____ (write down date or time passed)

Was this your first HIV test? Yes No

Gender Male Female

If subject tested less than 5 weeks ago, ask subject to call back when it will be 4 weeks.

If subject agrees, administer actual phase survey using above instructions.

Once survey is completed, negotiate place for subject to pick up payment.

Script 2

If subject has not been tested for HIV yet, ask whether he/she wants to be tested and suggest that he/she go to the Pittsburgh AIDS Task Force (it's free and anonymous) and he/she can participate in both phases of the study.

Separate principal components analyses were computed for positive test anticipation, negative test anticipation, and postresult actuals. The results of these principal components were generally consistent and robust. Individual loadings of the items were reasonably high (above .3 in almost all cases), and the amount of variance accounted for by the first component ranged between 39% and 44% in the three analyses. In each case, the second component accounted for about 10% of the variance and the third accounted for less than 10%. The results were virtually identical whether we used the raw data or standardized individual items. Given that every item loaded on the first component, we constructed a total score consisting of the sum of raw scores of all items coded in the negative direction (1 to 7 for the seven categories). We used three scores in the analysis: anticipation of a positive test result, anticipation of a negative test result, and actual posttest result. We also examined the data on an individual item basis and found that the results presented for the total scores were consistent with our individual item analysis. The analysis presented here is based on total scores.³

For discussion, we will define two samples: the PATF sample, consisting of 50 people for whom we have anticipations of both positive and negative test results (one subject failed to complete the negative anticipation phase, so there are 49 in it), and the newspaper sample, consisting of 45 HIV-negative and 21 HIV-positive subjects for whom we have postresult actuals.

RESULTS

Table 4 summarizes the main results of the study. Our first comparison consisted of posttest actuals for HIV-positive and HIV-negative subjects obtained through the newspaper sample. There is no question that

Table 4. Anticipated and actual distress

	Anticipated	Actual
PATF sample		
Positive test result	94.7 (22.6) <i>n</i> = 50	—
Negative test result	47.4 (16.1) <i>n</i> = 49	54.7 (20.7) <i>n</i> = 25
Newspaper sample		
Positive test result	—	77.6 (21.8) <i>n</i> = 21
Negative test result	—	59.1 (19.4) <i>n</i> = 45

learning that one is HIV positive is a stressful event; as a check of the validity of our data, it is important to ascertain the level of distress in our recently diagnosed HIV-positive subjects. Consistent with other studies that measured the short-term distress levels of subjects recently diagnosed with HIV (Perry et al., 1990, 1993), in the newspaper sample the distress level of our HIV-positive subjects (77.6) was higher than that of the HIV-negative subjects (59.1), $t(64) = 3.45$, $p < .001$.

The most important comparison was between the anticipated response to an HIV-positive result obtained from PATF subjects and the actual postresult response obtained from the HIV-positive newspaper subjects. This comparison revealed that anticipated distress following a positive test result (94.7) was higher than actual reported distress (77.6), $t(69) = 2.9$, $p < .005$.

We observed a similar discrepancy between anticipated and actual distress following a negative test result. PATF subjects anticipated a distress level of 47.4 five weeks after receiving a negative test result, but the actual level of distress among respondents in the newspaper sample who had received a negative test result was 59.1, $t(92) = 3.9$, $p < .002$. We also examined the relationship between expected and actual response to a negative test result by conducting a within-subject test with the sample of 25 HIV-negative subjects for whom we had both anticipation and postresult actual data. Although the difference between anticipated and actual distress levels was not significant, $t(24) = 1.5$, $p < .15$, actual distress levels (54.7) were higher than anticipated distress levels (49.8). The correlation between anticipated and actual distress levels for this sample was .62, suggesting that subjects were reasonably accurate in their predictions.

With the existing data sets it was also possible to examine the comparability of the newspaper and PATF samples and to test for selective dropout from the PATF sample. To test the comparability of the newspaper and PATF samples we compared the two samples' measures of postresult actual distress levels for subjects whose test results were HIV negative. The postresult actual score of the newspaper sample was 59.1, compared to a score of 54.7 for the PATF sample, a nonsignificant difference ($t(68) = .9$, $p > .35$). To test for selective dropout in the PATF sample, we compared the anticipations of subjects who were and were not lost to follow-up. Subjects lost to follow-up anticipated greater levels of distress following a positive test result (101.2) than those who completed the study (89.5; $t(48) = 1.85$, $p < .07$). If many of these subjects tested positive and accurately predicted their distress level, then they may have been too distressed to complete the survey. Unfortunately, we have no way of knowing the HIV status of these subjects or why they chose not to complete the survey, although the number is probably small.

given that the overall seropositive rate at PATF is 4% of those tested. Subjects lost to follow-up anticipated less distress given a negative test result (44.4) than subjects who were not lost to follow-up (49.7), but the difference is not significant. $t(47) = -1.1, p > .25$.

We found no difference in the median risk perceived by subjects who were and were not lost to follow-up (the median risk judgment was 1% in both cases). There was also no difference in median risk for subjects completing the anticipation phase before testing and those completing the anticipation phase after counseling and testing (again, it was 1%). Finally, there was no difference in the total level of distress anticipated for those who completed the survey before testing and counseling and those who completed the survey after testing and counseling. As noted earlier, the risk assessment and notation of when subjects completed the survey were added once the survey began, so we have data on about 30 subjects for each of these variables. Whether this was the first time a subject was tested for HIV, or whether he or she had been tested before, had no bearing on the anticipations or postresult actuals. Moreover, there was no significant difference between men and women in anticipated or actual distress.

DISCUSSION

Taken together, these results suggest that the anticipated response to an HIV test result is more extreme—more distress if positive and much less distress if negative—than experienced. The overestimation of distress following a positive HIV test result may prevent some people from seeking testing.

However, the data used in our analysis have serious limitations. All the main comparisons between predicted and actual distress may have been affected by selective dropout from the sample or by the noncomparability of the PATF and newspaper samples. Nevertheless, we have learned much from the current study and have several recommendations for future research.

One suggestion we have for researchers who attempt to conduct a similar study is to be less concerned about maintaining strict anonymity. Our adherence to strict anonymity prevented us from following up subjects who did not return to us on their own—a severe limitation for a within-subject study. There are many reasons why subjects may have not returned for the second phase of the study, but with strict anonymity we cannot discriminate between these reasons. The great difficulty with anonymity is that the subject is responsible for callback. Some subjects may have tested positive and been too distressed to follow through with the survey. Other subjects may have neglected to return for their

test result. Some subjects may have lost our phone number, forgotten or been unable to reach us. Our policy of strict anonymity prevented us from learning the HIV status of subjects who were lost to follow-up, or even determining whether these subjects returned for testing at all. It would be useful to obtain information on the HIV notification status (positive, negative, never returned) of subjects lost to follow-up; this could be done while maintaining anonymity. Also, it would be desirable to keep a count of the number of subjects who come for testing but choose not to participate in the study.

It is worthwhile to consider whether confidentiality, as opposed to anonymity, might provide sufficient safeguards for subjects. Confidentiality would facilitate follow-up, although it might also limit the number of people who agree to participate at the outset (Miller, 1994). It might be possible to retain anonymity in the long run but, with the subjects' permission, to gain access to their telephone numbers for the duration of the study.

Collecting data over a longer period of time and in multiple locations would increase the sample size and the likelihood of obtaining both HIV-positive and HIV-negative subjects. Although the ideal situation would be to survey every person tested for HIV over a given period of time, such sampling is neither possible nor ethical. Working with a number of providers of HIV testing (e.g., STD clinics, private physicians, sites such as PATF, health departments, and hospitals) would provide at least a cross-section of testing facilities and people who seek testing; it would also increase the likelihood of obtaining a sufficiently large seropositive sample. Location is important as well; a city such as Pittsburgh, where most people with HIV/AIDS are those returning home for health care after testing HIV positive or becoming symptomatic elsewhere, may be a poor choice for such research.¹

We did not obtain current feelings at the time of HIV testing. Studies of HIV notification found that psychopathology at the time of testing was the best predictor of psychopathology after notification, and it is important to compare current mood to anticipated and postresult actuals (Perry et al., 1990, 1993). We chose not to collect such data; given our limited resources, we were concerned that collecting such data would give subjects too many surveys to complete and bias their anticipation responses. With a large sample, it would be possible to obtain current and anticipated mood by varying the surveys administered to subjects and using a combination of within- and between-subject designs.

In sum, our results suggest that people overestimate their reactions to HIV test results by anticipating more distress given a positive result and less distress given a negative result than they actually experience. If replicated by further research, this finding suggests that many deci-

sions concerning the choice to be tested may be biased and that educating people about their own likely reaction to test results could be beneficial.

Notes

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1. Although there are no formal records of the seroconversion rate, based on the number of seropositive test results at facilities such as the Pittsburgh AIDS Task Force and the health department, the seroconversion rate seems to be low (less than 1%). We have no way of knowing the seroconversion rate for those who visit private physicians for HIV tests.

2. We used principal components merely as a guide to determine which sets of scores could be summed together. We realized that with small sample sizes and no assumption of measurement error, the use of component scores would be inappropriate, but determined that the analysis could guide us in determining subsets of variables.

3. Summing standardized scores produced virtually identical results.

4. For example, it was estimated in 1994 that 25% of the gay men in Pittsburgh were HIV positive (including those with AIDS). The number of positive HIV tests in locations such as the PAIF and the county health department fails to account for this number, and it is unlikely that all of these people were tested by private physicians. The presence of good health care and medical research projects as well as the presence of family members may attract people to return to Pittsburgh.

References

- Brandt, J., Quaid, K. A., Folstein, S. E., Garber, P., Maestri, N. E., Abbott, M. H., Slavney, P. R., Franz, M. L., Kasch, L., & Kazazian, H. H., Jr. (1989). Presymptomatic diagnosis of delayed-onset disease with linked DNA markers: The experience in Huntington's disease. *Journal of the American Medical Association*, *261*(21), 3108-3114.
- Kahneman, D., & Snell, J. (1990). Predicting utility. In R. M. Hogarth (Ed.), *Insights in decision making: A tribute to Hillel J. Einhorn*. Chicago: University of Chicago Press.
- Loewenstein, G., & Adler, D. (1995). A bias in the prediction of tastes. *Economic Journal*, *105*, 929-937.
- Loewenstein, G., & Frederick, S. (1997). Predicting reactions to environmental change. In M. Bazerman, D. Messick, A. Tenbrunsel, & K. Wade-Benzoni (Eds.), *Environment, ethics, and behavior*. San Francisco: New Lexington Press.

- Mastromauro, C., Myers, R. H., & Berkman, B. (1987). Attitudes toward presymptomatic testing in Huntington disease. *American Journal of Medical Genetics*, *26*, 271-282.
- Miller, M. D. (1994). *The tradeoff between anonymity and confidentiality*. Unpublished manuscript.
- Mouton, J. M., Stempel, R. R., Bacchetti, P., Temoshok, L., & Moss, A. M. (1991). Results of a one-year longitudinal study of HIV antibody test notification from the San Francisco General Hospital cohort. *Journal of AIDS*, *4*, 787-794.
- Perry, S., Jacobsberg, L., Card, C. A. L., et al. (1993). Severity of psychiatric symptoms after HIV testing. *American Journal of Psychiatry*, *150*, 775-779.
- Perry, S., Jacobsberg, L., Fishman, B., et al. (1990). Psychological responses to serological testing for HIV. *AIDS*, *4*, 145-152.
- Read, D., & Loewenstein, G. (1995). Diversification bias: Explaining the discrepancy in variety seeking between combined and separated choices. *Journal of Experimental Psychology: Applied*, *1*, 34-49.
- Simonson, I. (1990). The effect of purchase quantity and timing on variety seeking behavior. *Journal of Marketing Research*, *32*, 150-162.
- Wiggins, S., Whyte, P., Huggins, M., Adam, S., et al. (1992). The psychological consequences of predictive testing for Huntington's disease. *New England Journal of Medicine*, *327*(20), 1401-1405.