Background. Many preventive health behaviors involve immediate costs and delayed benefits. Time preference is the extent to which decision makers value future outcomes relative to immediate ones. Consequently, people with future-oriented time preferences should be more likely to adopt preventive measures. The relationship between time preferences and acceptance of a free influenza vaccination was examined. Sample. The participants were 412 corporate employees who were offered free influenza vaccinations at their workplace. Measures. Participants' time preferences were measured in each of two domains: money and health. They also reported on whether they had accepted the influenza vaccination and their beliefs and attitudes about the vaccine. Results. There was a small (OR = 2.38) relationship of vaccination acceptance to monetary time preferences but not to the health time-preference measures. Other variables, such as perceived effectiveness of the vaccine, were more predictive. Conclusion. This study provides some evidence of a small relationship between time preferences and preventive health behavior. Key words: time preference; decision making; preventive health behavior; influenza vaccine. (Med Decis Making 1999;19:307–314)

One of the primary questions addressed by studies of health behavior is: why do people often fail to take preventive health measures? For example, why do people fail to adopt diets and exercise regimens that would reduce their risk of coronary heart disease? Why do people continue to smoke and use other hazardous substances? Why do people neglect to receive recommended vaccinations? If we can better understand the underlying sources of such failings, we will be better equipped to ameliorate them. In an era of managed care and cost cutting, patients are being encouraged to take greater responsibility for their own health. Adopting preventive health behaviors is a key component of that responsibility.

One reason people may fail to take preventive measures is lack of relevant information. For example, a person may eat a high-fat diet because he or she does not know that it is linked to heart disease. A second reason is that people may not believe the information available to them: someone may continue to smoke because he or she does not believe that it causes lung disease. A third reason for failing to engage in preventive behavior may be that people do not value the outcomes of the preventive behavior. For example, someone may neglect to practice safe sex because the pleasures of unsafe sex are preferable to a lower risk of infectious disease.

In terms of utility theory, belief corresponds to probability and value corresponds to utility. In addition to the probability and utility of outcomes, utility theory also incorporates the timing of the outcomes of behavior. For example, the costs of a low-fat diet begin immediately, in the form of refraining from eating favorite foods. The benefits, however, occur only later, because the cardiac events prevented would not have occurred until after a delay. Discounted utility theory incorporates delays by applying a temporal discount factor to delayed outcomes. A positive discount rate reduces the value of delayed outcomes relative to immediate outcomes, while a negative discount rate reflects a greater value for delayed outcomes, and a zero dis-
count rate indicates no adjustment in value based on timing.

Although discount rates are a feature of normative decision theory and thus do not necessarily represent descriptive decision making, it is possible that individual decision makers have subjective time preferences that reflect how they value delayed outcomes relative to immediate events. In fact, a number of studies have assessed the implicit discount rate that decision makers use when making hypothetical decisions about health or other outcomes.9-11

Time preferences thus provide an additional reason people may fail to engage in preventive health behaviors. Preventive health measures involve making an up-front investment in return for a long-term gain. If subjective time preferences are a stable personality attribute, then one would expect people with low (future-oriented) discount rates to be more likely to engage in preventive behaviors. The more value placed on future health states relative to present outcomes, the more likely one should be to take preventive measures.

The only previous study to examine the relationship between time preferences and preventive health behavior is one conducted by Fuchs.12 He asked 508 community members aged 25 to 64 a series of monetary time preference questions such as “Would you choose $1,500 now or $4,000 in five years?” The monetary amounts and delays varied across questions. In addition, Fuchs asked respondents about several preventive health behaviors: smoking, exercise, seat-belt use, dental examinations, and being overweight. Time preferences had a small relationship to smoking but were not significantly correlated with any of the other health behaviors. In addition, exercise was related to discount rates for men, but in the opposite direction to that expected. A measure of health status did show a small correlation with time preference, suggesting that those with future-oriented time preferences engage in more health-improving behaviors, resulting in a better health status. Thus, time preferences were related to some, but not all, measures of health behavior, and the observed correlations were quite small. Fuchs also found larger correlations between discount rates and other respondent characteristics, such as age and education, indicating that it is possible to detect correlates of time preferences.

Two related studies by Mahon and colleagues13,14 examined the relationship between future time perspective and health practices. They defined future time perspective as the extent to which the future is perceived as predictable, structured, and controllable. Thus, time perspective is distinct from, yet related to, time preferences. Mahon used a 25-item inventory that contained items such as “the future looks vague and uncertain to me.” This scale was moderately correlated with a composite measure of health behavior that included exercise, nutrition, relaxation, safety, substance use, and health promotion. The correlation was higher (0.52) for young adults than it was for middle (0.20) or late (0.26) adolescents. Interestingly, time perspective was related to all of the individual components of the health behavior score with the exception of exercise. This result is of note because Fuchs12 also found that exercise was not related to time preferences in the direction expected, whereas other behaviors showed directional, if not significant, relationships.

Because of the small amount of previous evidence regarding the association between time preferences and behaviors, the purpose of the present study was to examine the relationship between time preferences and one particular preventive health behavior: accepting the influenza vaccination. Like other preventive health measures, the flu shot involves an up-front cost and a delayed benefit. The cost and inconvenience of the vaccination, in addition to the pain of the injection, occur right away. Also, possible side effects from the injection, such as a sore arm, occur soon after. In contrast, the benefits are delayed. Whereas the vaccine is administered in October and November, the cases of influenza that the shot is intended to prevent usually occur several months later. Consequently, we predicted that those with more future-oriented time preferences would be more likely to accept the vaccination.

In the present study, time preferences were measured much as they were in the Fuchs12 study; participants were asked to choose between present and future outcomes. However, unlike the Fuchs study, the choices were made between losses (negative events) rather than between gains (positive events). This feature reflects the fact that outcomes associated with accepting or rejecting the flu shot (inconvenience, side effects, getting influenza) are likely to be viewed as losses relative to the reference point of usual good health. In addition, not only monetary time preferences were assessed. Participants were also presented with intertemporal tradeoffs between influenza-related health states, because these tradeoffs are likely to be more similar to those encountered in actual decisions about whether to obtain a flu shot.

Time preferences and other potential predictors of flu-shot acceptance were examined in a corporate workplace setting. In the workplace selected for data collection, free influenza vaccinations were offered in October 1997. The shots were well publicized so that virtually all employees knew of their availability. Care was taken to ensure inclusion of only employees who knew about the free flu shots and were on site when they were available. Thus, failing to accept
the vaccination could not be explained by the fact that some employees did not know of the option of receiving a shot, and all participants were faced with a decision. In addition, the vaccinations were offered at the on-site employee health center, so that transportation and scheduling were unlikely to play a role in flu-shot acceptance.

Method

Participants. Study participants were employees at a corporate workplace that employed 850 people. The workplace health center administered 332 flu vaccinations during the fall months leading up to the completion of data collection for this study (an acceptance rate of 39%). Questionnaires were distributed to secretarial staff in each division of the building, and they delivered questionnaires to 678 individual employees. The questionnaires were distributed on December 1, 1997, and by December 10 (the close of the study), 435 questionnaires had been returned via inter-office mail to the employee health service (64% response rate). Regardless of whether they returned a questionnaire, potential participants received a $1.00 coupon redeemable at the company store.

The percentage of questionnaire respondents who reported receiving a flu shot from the workplace health center (40%) was very similar to the percentage of employees who received a flu shot from the workplace health center (39%). Thus, the questionnaire sample appears to be representative of the entire research center staff in terms of vaccination acceptance rate and also by virtue of the fairly high response rate. Forty-three percent of the respondents were women and 80% were white (5% African American, 10% Asian, 3% Latino, and 2% other). The median respondent was in his or her 40s, had a college degree, and had a household income between $75,000 and $100,000.

Questionnaire. In addition to a measure of influenza vaccination acceptance, the questionnaire contained three sections: the first contained three questions designed to measure time preferences, the second measured a number of other potential predictors of vaccination acceptance, and the third assessed demographic information (summarized above).

Dependent variable. The dependent variable of the study was a question eliciting whether the respondents had been vaccinated against influenza at their workplace during the fall months preceding the study. Reported vaccination acceptance was used as the dependent measure since the responses were anonymous and it was not possible to consult employee medical records to verify actual vaccination acceptance. Respondents were asked whether they had known that free flu shots were available at their workplace and whether they had been present at the workplace at the time the flu shots were being offered. Respondents who had not been aware or had not been present (n = 22, 5%) were excluded from data analysis. (In addition, one participant who had received a flu shot outside the workplace was excluded.) Thus, data from 412 participants were included in the analyses.

Time-preference measures. Three questions assessed time preferences, as shown in the appendix. The first of these asked respondents to imagine they had received a parking ticket and had to pay either a $20 fine today or a larger fine three months from now. Eight response options were provided and the participants were asked to select the option that corresponded to the amount of the delayed option that would make it just as unattractive as the immediate option. Possible monetary responses ranged from $20 to $90 in $10 increments.

The second time-preference question asked the respondents to imagine that they would get the flu during the coming winter. This flu could occur in one of two ways: either a flu that starts today and lasts for two days or a flu that starts three months from now and lasts longer. As with the monetary question, participants selected one of eight response options that corresponded to the duration of flu for the delayed option that would make it just as unattractive as the immediate option. Potential flu responses ranged from two to nine days in one-day increments.

The third time-preference question assessed the respondents' preferences for sequences of outcomes. A scenario described a situation in which the respondent had a cough that lasted for three months. Two graphs illustrated how the cough might change over time. In the first graph, the cough started out mild and increased gradually in severity over three months. In the second graph the cough became severe and then decreased gradually in severity over three months. In the second graph the cough quickly became severe and then decreased gradually in severity and resolved at the end of three months. The total amounts of severity were equal in the two graphs. Participants responded on a five-point scale that ranged from strongly preferring the worsening graph to strongly preferring the improving graph. This sequence question was similar to those used in previous studies of time preferences.15–18

Additional predictors. The second section of the interview contained questions about beliefs and attitudes toward the flu shot as well as medical history. The questions included whether the respondent had received a flu shot the previous year, and (for decliners) whether he or she had ever received a flu shot. The respondents indicated whether they...
had had a bad case of the flu the previous year, and whether they had ever felt sick as a result of a flu shot. Respondents were also asked how likely they thought it was that the flu vaccine would cause a bad reaction, and how effective they thought the vaccine was. They indicated the time at which they would get the flu if they were to get it in the coming winter. A set of three questions asked about locus of control. Specifically, participants were asked how much they agreed that their doctor could ensure that they did not get the flu, that they themselves could take action to avoid the flu, and that chance factors would determine whether they get the flu. They were asked to give the most important reason that they had or had not received a flu shot that season (free response). They were also asked whether they had had a dental examination, eye examination, or general physical examination in the past two years. More details about these variables are available elsewhere. After determining which variables in this set were predictive, we examined whether time preferences were predictive of vaccination acceptance above and beyond other predictors.

Results

Time-preference distributions. All three time-preference questions demonstrated very future-oriented time preferences. For the time-preference question about the flu, 85% of the respondents expressed a zero time preference, saying that two days of flu now was just as unattractive as two days of flu starting in three months. The median response of respondents who gave answers greater than 2 was four days. The mean over all participants was 2.38 days. For the time-preference question about the parking ticket, 83% of the respondents expressed a zero time preference, saying that paying $20 in three months was just as unattractive as paying $20 now. The median response of respondents who gave answers greater than $20 was $30. The mean over all participants was $24.

The question about cough sequences showed that improving sequences were preferred to worsening sequences. The improving sequence was strongly preferred by 66% of the respondents and the mean rating was 4.44 on a five-point scale, where 5 indicates a strong preference for the improving sequence and 1 a strong preference for the worsening sequence. This response pattern demonstrated a negative time preference because the participants preferred to experience negative events (the worst cough) sooner rather than later. The previous two time-preference questions did not allow for expression of a negative time preference. Previous research on preferences for sequences has also found negative time preferences.

Because of these skewed distributions, the three-time preference questions were recoded as dichotomous variables. The flu and parking-ticket discount responses were divided into categories of zero discounting (minimum indifference point) and positive discounting. The sequence responses were divided into categories of strongly preferring the improving sequence versus all other responses.

Time preferences and flu-shot acceptance. Monetary time preferences were related to flu-shot acceptance. Forty-five percent of those with zero time preferences accepted the shot, compared with 29% of those with positive time preferences ($\chi^2 [1, n = 405] = 5.36, p = 0.02, OR = 1.24$). Health discount rates were unrelated to shot acceptance ($43\%$ vs $38\%$ $\chi^2 [1, n = 409] = 0.53, p = 0.47, OR = 1.24$). All other categories

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Numbers of Subjects Who Accepted and Who Declined the Vaccine, Stratified by Time Preference</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Vaccination Status</td>
</tr>
<tr>
<td></td>
<td>Accepted</td>
</tr>
<tr>
<td>Monetary time preference</td>
<td></td>
</tr>
<tr>
<td>Zero</td>
<td>152 (45%)</td>
</tr>
<tr>
<td>Positive</td>
<td>19 (29%)</td>
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<tr>
<td>Flu time preference</td>
<td></td>
</tr>
<tr>
<td>Zero</td>
<td>151 (43%)</td>
</tr>
<tr>
<td>Positive</td>
<td>22 (38%)</td>
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<tr>
<td>Sequence time preference</td>
<td></td>
</tr>
<tr>
<td>Strongly prefer improving</td>
<td>116 (42%)</td>
</tr>
<tr>
<td>All other categories</td>
<td>57 (44%)</td>
</tr>
</tbody>
</table>

An association between time preferences and vaccination acceptance is particularly expected in people who anticipated a lengthy delay between receiving the vaccine and getting the flu. Time preferences were hypothesized to be related to vaccination acceptance because accepting a flu shot involves an immediate cost (in terms of time, pain, and possible side effects) in exchange for long-term benefits. Thus, for those subjects who did not view the costs and benefits of the shot to be separated by time, time preferences should not be predictive. There was little variation in the timing of the subjects' receipt of the flu vaccinations. We therefore simply examined the subjects' expectations of the timing of flu onset. Thirty-five percent of the participants ex-
expected to get the flu in February or later (a delay of two months or more following questionnaire completion), while the remainder expected shorter delays.

We examined the time preferences of those participants (n = 135) who expected to get the flu after at least a two-month delay. For these participants, flu prevention would be delayed relative to the cost of receiving the vaccination. Limiting the analysis to this subset made a difference for the cough-sequence question only. For this subset, those who strongly preferred an improving cough sequence were more likely than others to accept the shot (45% vs 26%; $\chi^2[1, n = 135] = 4.27, p = 0.04, \phi = 0.17$, OR = 2.33). The remaining participants (those who expected to get the flu before the end of two months) showed a somewhat opposite pattern (41% vs 52%; $\chi^2[1, n = 256] = 3.18, p = 0.07, \phi = -0.11$, OR = 0.64).

Other predictors of shot acceptance. Of the remaining questions contained in the questionnaire, four were independent predictors of vaccination acceptance (see Chapman and Coups\(^\text{19}\)):

- perceived effectiveness of the vaccine ($\chi^2[1, n = 398] = 23.88, p = 0.0001, OR = 2.34, r = 0.49$);
- perceived risk of vaccination side effects ($\chi^2[1, n = 398] = 5.90, p = 0.02, OR = 0.68, r = 0.31$); having received the vaccine the previous year ($\chi^2[1, n = 398] = 81.95, p = 0.0001, OR = 16.04, r = 0.66$); and the estimated percentage of coworkers who accepted the vaccine ($\chi^2[1, n = 398] = 6.57, p = 0.01, OR = 1.49, r = 0.24$).

Each of the time-preference variables was added to a logistic regression containing these four predictors. (Three separate regressions were carried out, one for each time-preference measure). Monetary time preferences were related to vaccine acceptance even after accounting for these other variables ($\chi^2[1, n = 398] = 4.98, p = 0.03, OR = 2.54$). Neither flu time preference (OR = 1.65, p = 0.24) nor cough-sequence preference (OR = 0.90, p = 0.74) was related to vaccination acceptance.*

The participants’ estimates of when they would contract the flu were then added to the regressions along with the interaction between estimated delay and time preferences. Estimated delay was not related to vaccination acceptance (ps > 0.25). Interactions between time preference and estimated delay were not significant for monetary or flu time preference. The interaction with cough-sequence preference was marginally significant ($\chi^2[1, n = 383] = 3.31, p = 0.07, OR = 3.91$). This marginal interaction reflects the fact that sequence preferences were related to vaccination acceptance only for those who anticipated long delays before contracting the flu.

**Discussion**

Preventive health behaviors involve costs and benefits that occur at different points in time. Consequently, it is reasonable to expect that preferences for timing of events would be related to likelihood of performing preventive behaviors. Specifically, we predicted that people with future-oriented time preferences would be more likely to accept a free influenza vaccination and that this relationship would be especially strong for those who viewed the benefits of the vaccine as delayed relative to the costs.

The current study did provide some evidence that time preferences are related to preventive health behavior: specifically, monetary time preferences were found to predict flu-shot acceptance. In addition, expected delay to getting the flu was a marginally significant moderator of the relationship between time preferences and vaccination acceptance for one of the three time-preference measures (sequence preferences). However, the size of the relationship between time preferences and vaccination acceptance was small compared with the other predictors identified, such as perceived effectiveness, perceived likelihood of side effects, and previous receipt of the flu shot. Furthermore, the relationship between vaccination acceptance and time preferences did not appear for all time-preference measures. Thus, the relationship between time preferences and preventive health behavior appears to be small and not consistently found, similar to the results found by Fuchs.\(^\text{12}\)

Interestingly, the monetary time-preference question showed more of a relationship to vaccination acceptance than the other two time-preference measures did. This result was surprising, because the flu time preference and cough-sequence questions are more similar in content to the actual decision of whether to accept the flu shot. One reason for the greater predictive value of the monetary time-preference question may be that monetary intertemporal choices are more familiar and thus yield more reliable responses. Whereas many people have faced parking ticket fines (with increased fines...
if the ticket is paid late), the health-related time-preference questions probably appeared more hypothetical. Responses to more hypothetical questions are likely to be less reliable and therefore less related to actual behaviors.

MAGNITUDE OF TIME-PREFERENCE—VACCINATION ASSOCIATION

An important question for future research is why the relationship between time preferences and vaccination acceptance was weak and inconsistent. One possibility, of course, is that time preferences play only a small role in decision making about preventive health behavior. Beliefs about the outcomes of preventive behaviors (e.g., perceived effectiveness of the vaccine) and the subjective value of the costs and benefits may overshadow the role of preferences for the timing of those costs and benefits. Two measurement issues, however, offer alternative explanations for the small correlation.

First, the distribution of the time-preference responses was quite skewed in the current study. A large majority of participants showed zero discounting on the flu and parking ticket questions and a strong preference for improvement on the cough-sequence question. This distribution was surprising, because previous studies of subjective discounting for health outcomes have found exceedingly high discount rates with similar types of questions. (Other studies, however, have found more moderate health discount rates. Chapman et al., for example, found that outpatients showed annual discount rates averaging 100% for a six-month delay up to 20,000% for a one-month delay. The current study used a three-month delay, and thus annual discount rates in the hundreds or thousands of percent were expected. The time-preference questions did not provide enough resolution for moderately high discount rates. For example, since the monetary question identified indifference points to within $10, the indifference point above $20 (corresponding to zero discounting) was $30, which corresponds to a 400% annual discount rate. If the large majority of participants have subjective discount rates smaller than this, finer resolution is needed in measuring time preferences. In addition, the measures did not allow for the expression of negative discount rates. With a low sensitivity of time-preference measures in this study, detection of significant associations between time preferences and vaccination acceptance was impaired.

A second measurement issue relevant to the current study is the consistency of time preferences across time and situations. If time preferences comprise a type of consistent personality trait, then we would expect subjective discount rates measured in one context (e.g., on a questionnaire) to correspond to intertemporal choices made in another context (e.g., in actual behavior). A large body of research, however, indicates that decision makers do not have one discount rate. Instead, time preferences vary with the lengths of the delays, the magnitudes of the outcomes, and whether the outcomes are described as gains or losses, as single outcomes or as sequences, or as health or money outcomes. Thus, it is quite possible that the time preferences applied to questionnaire scenarios are not those applied to actual health decisions. We sought to address this issue in the current study by including time-preference questions that were specific to influenza and its symptoms. As discussed earlier, however, these measures were even less correlated with vaccination acceptance than were monetary time preferences. Time preferences have been found to vary across different health outcomes even when described in analogous forms. Thus, the flu time preference and cough-sequence questions may not have been similar enough to the vaccination-acceptance decision.

THE NORMATIVE STATUS OF PREVENTIVE HEALTH BEHAVIORS

Although the present study is descriptive, it suggests the normative question of whether people should engage in preventive health behaviors such as receiving a flu shot. Many health services researchers would answer in the affirmative because they view the benefits of such behaviors as outweighing the costs. A calculation of the net benefits of a preventive behavior, however, requires the inclusion of a discount rate when the outcomes are delayed. Given a sufficiently high discount rate, the benefits of a flu shot do not outweigh the costs. Consequently, there are two possible responses to the question of whether preventive behaviors are normative.

One possible response to this normative question is that a rational decision is determined by a combination of objective facts contributed by experts (e.g., the effectiveness of the vaccine or the prevalence of influenza) and subjective preferences contributed by the decision maker. These subjective preferences include utilities for relevant outcomes (e.g., having the flu) and time preferences. If a decision maker’s time preference were represented by a very high discount rate, it would indeed be rational to reject preventive behaviors such as receiving a flu shot. Similarly, if one’s disutility for having the flu were near neutral, rejecting the flu vaccine would be legitimate. Under this argument, the only defensible intervention to alter vaccination decisions would be correction of misinformation about facts,
such as the effectiveness of the vaccine or its side effects. According to this view, a strong relationship between time preferences and influenza vaccination would be seen as evidence that decision makers were acting rationally and that their chosen behaviors should not be questioned.

A second possible response to the normative question is that decision makers do not have well-defined preferences, and, therefore, expressions of their preferences should not necessarily guide prescriptions about behavior. According to this argument, subjective discount rates of very high magnitude are not legitimate preferences, in part because they can be manipulated so easily by the form and context of the question. Preventive behaviors such as vaccination are recommended if the benefits outweigh the costs using a reasonable discount rate, where "reasonable" is determined by a decision analyst and not by the individual decision maker. According to this view, a strong relationship between time preferences and influenza vaccination would argue for an intervention to try to reduce subjective discount rates. The tension between these two views represents a disagreement about normative issues and cannot be resolved with empirical studies.

Conclusion

Preventive health behaviors such as acceptance of the influenza vaccination involve intertemporal choices. This study revealed a relationship between time preferences and vaccination acceptance, but it was small relative to other predictors. Improved time-preference measures may detect this relationship more successfully.

Thanks are due to Carol Christensen, Elaine Ferenbach, Karen Gabor, Jeffrey Gonzalez, Laura Niedermayer, and Alexa Tapanes for help with administering the study and to two anonymous reviewers for comments on an earlier draft.

References


(See next page for appendix.)
APPENDIX

Time-preference Questions

1. Imagine that you just got a parking ticket. This means you will have to pay a fine in cash. You have two options:

   A. You pay a $20 fine today.
   B. You pay a $_____ fine 3 months from now.

What amount would make these two options equally attractive (or unattractive) to you? Pick the value closest to your answer.

   a. $20    e. $60
   b. $30    f. $70
   c. $40    g. $80
   d. $50    h. $90 or more

2. Now imagine that you get the flu this winter. You feel so weak and achy that you can’t get out of bed. You have a high fever, a sore throat, and a persistent, painful cough. You sneeze and your nose is runny and stuffy. Your eyes are watery and itchy. The flu doesn’t lead to any serious complications, and after you recover from the flu, you feel fine. There are two ways in which you could experience the flu:

   A. Your flu starts today and lasts for 2 days.
   B. Your flu starts 3 months from now and it lasts for _____ days.

What amount would make these two options equally attractive (or unattractive) to you? Pick the value closest to your answer.

   a. 2    e. 6
   b. 3    f. 7
   c. 4    g. 8
   d. 5    h. 9 or more

3. Imagine that you have a nagging cough that is left over from a case of the flu. Your doctor has given you some medication that will clear up the cough, but nevertheless it will take about 3 months until the cough is completely gone. The cough won’t lead to anything more serious, but it is painful and causes a tickle in your throat.

Here are two graphs that show how your cough might change over time. The heights of the bars show how severe the cough is (taller bars mean more severe). In graph A, the cough starts out very mild, but gets gradually worse. In graph B, the cough quickly becomes very severe but then gradually becomes milder. In both cases the cough has the same overall severity, and it is gone at the end of the three months. Which sequence would you prefer to experience?

   a. Strongly prefer A
   b. Slightly prefer A
   c. Prefer A and B equally
   d. Slightly prefer B
   e. Strongly prefer B