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On the distinction between yuppies and hippies: Individual differences in prediction biases for planning future tasks

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Abstract

The present study investigated variables related to errors in predicting when tasks will be completed. Participants ($N = 184$) responded to the Time Structure Questionnaire (TSQ; Jones, Banicky, Pomare, & Lasane, 1999) and Temporal Orientation Scale (TOS; Bond & Feather, 1988) and predicted when they would complete either a desirable or undesirable task. Factor analysis of the TSQ and TOS identified two factors: yuppie traits, which involved being hard-working and goal-oriented, and hippie traits that reflected “living for the moment”. Overall, individuals tended to underestimate when they would complete both tasks. However, for the undesirable task, yuppie traits corresponded with less prediction bias whereas hippie traits were associated with greater bias.

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1. Introduction

Kahneman and Tversky (1979) observed that individuals typically underestimated how much time they needed to complete their projects despite the fact that similar tasks in the past had taken longer than expected. They described this optimistic bias as the “planning fallacy” which subsequent research has shown to occur for predictions about the completion of many different tasks, including honors theses (Buehler, Griffin, & Ross, 1994), word puzzles, tax forms (Buehler, Griffin, & MacDonald, 1997), origami, furniture assembly (Byram, 1997), and computer programming (Connolly & Dean, 1997).

One reason individuals’ predictions are optimistically biased is that they may discount problems they had previously experienced on similar tasks in order to avoid self-blame (Buehler et al., 1994). Another reason is wishful thinking – that is, they simply *want* to finish early, especially when anticipating a desired outcome (Buehler et al., 1997). Finally, people may make optimistic predictions in order to appear more productive and successful to others. In one study, Pezzo, Pezzo, and Stone (2006) found that participants who made anonymous predictions did not show an optimistic bias.

Although optimistic prediction biases are common, these errors are not made by everyone; in several studies, some participants were found to make predictions that are either quite accurate (i.e., no significant bias), or even relatively *pessimistic* (i.e., finished sooner than expected) (Byram, 1997; Connolly & Dean, 1997; Pezzo et al., 2006). Overall, these findings suggest there are differential tendencies to make prediction biases. However, exactly which characteristics of individuals are most relevant to these tendencies is not clear.

Recently, Buehler and Griffin (2003) investigated whether prediction biases might be related to individual differences in optimism and procrastination (see also Pychyl, Morin, & Salmon, 2000). However, in two separate studies, no significant relationships between prediction biases and either of these personality traits were found, possibly because optimism and procrastination are more related to overall positive outlook and task-initiation, respectively, rather than prediction-accuracy or task-completion.

One personality variable that may be related to prediction bias is *time structure*, defined as the degree to which one views their use of time as structured and purposive, for which the primary instrument is the 26-item Time Structure Questionnaire (TSQ: Bond & Feather, 1988). Although TSQ scores have been found significantly correlated with prediction biases, the nature of the relationship is unclear; Burt and Kemp (1994) reported that the TSQ correlated negatively with prediction-accuracy, while Francis-Smythe and Robertson (1999a) found that TSQ scores and accuracy were positively related. However, both of these studies measured predictions for tasks that participants had to complete *immediately*, whereas most studies have typically involved planning for tasks that can be completed at a later time (e.g., Buehler et al., 1994), which may involve a different set of thought processes.

Although the directional relationship between time structure and *predictions* about completing tasks is not clear, there is a relatively unambiguous connection between this construct and the *actual* completion of tasks. Bond and Feather (1988) found that TSQ total scale scores correlated positively with good study habits and delay avoidance, while the TSQ subscales, Structured Routine, Persistence, and Effective Organization, have been found positively correlated with Type A personality (i.e., impatience and irritability related to motives for achievement).

Related research by Francis-Smythe and Robertson (1999b) found these same three TSQ subscales were also positively correlated to punctuality. Additionally, Mudrack (1997) reported that the TSQ Persistence subscale is related to the belief that hard work leads to success. Thus, time structure appears to involve intentions to accomplish work and to complete tasks in a timely manner.

Another personality variable that may correspond with completing tasks on time is *temporal orientation*, which reflects tendencies to focus on the past, present, or future. Several measures of temporal orientation have been developed, most notably the 56-item Time Perspective Questionnaire (TPQ; Zimbardo & Boyd, 1999). Recently, Jones et al. (1999) developed a brief, reliable Temporal Orientation Scale that is highly similar to the TPQ, but is comprised of only 15 items.

In past research, individuals with a future-orientation tended to be more work-oriented, have greater academic achievements (Lasane & Jones, 1999; Zimbardo & Boyd, 1999), and complete tasks on schedule (Jones et al., 1999). Harber, Zimbardo, and Boyd (2003) found that future-oriented students volunteered to participate in psychology experiments sooner and completed their quota earlier than present-oriented students. Present-oriented individuals live “for the moment” (Kelly, 2003), value social relationships over academic success (Lasane & Jones, 2000), and are impulsive and risk-taking (Keough, Zimbardo, & Boyd, 1999; Zimbardo, Keough, & Boyd, 1997). Finally, past-orientated individuals ruminate over past regrets rather than focus on either the present or future (Jones et al., 1999). Thus, similar to time structure, temporal orientation appears to reflect a differential focus on accomplishment and work over recreation and self-absorption.

1.1. Summary of past research and overview of the present study

Past research has not consistently shown significant relationships between personality and predictions about completing tasks on time, possibly because these studies have investigated variables related more to task *initiation* than to timely task *completion*, or have examined degree of positive outlook rather than tendencies to focus on work over recreation. When significant relationships between personality and prediction biases have been found, the meaning of the results has been unclear, perhaps because assigned tasks had to be completed immediately rather than requiring advanced planning. In the present study we examined relationships between individual differences in participants’ need for time structure and temporal orientation, two personality variables expected to correspond with timely task-completion for tasks to be completed in the near (but not immediate) future.

We expected that overall, individuals would make optimistic predictions, as in previous research (e.g., Buehler et al., 1994, 1997). However, we also hypothesized that individuals who perceived themselves as effective at structuring their time and who were more future-oriented (i.e., “task focused”) would complete tasks sooner, whereas individuals who were less structured and more present- or past-oriented (i.e., “task unfocused”) would delay completing tasks. In turn, faster completion time was expected to translate into less optimistic prediction biases while later task-completion would result in more optimistic biases. Additionally, because most aspects of time structure and temporal orientation appear to reflect overlapping constructs, we also evaluated the dimensionality of these measures with the expectation that underlying “task focused” and “task unfocused” factors may emerge.

Moreover, in recognition that persistence in working on tasks to completion can be influenced by a task's relative pleasantness (e.g., Blunt & Pychyl, 2000), we also examined the impact of task desirability; participants were randomly assigned to complete either a relatively desirable or undesirable task. Consistent with previous research by Ariely and Wertenbroch (2002), which suggests that individuals faced with unenjoyable tasks self-impose early deadlines to “get it over with” (see also Buehler et al., 1997, Experiment 2) we expected participants to be especially optimistic regarding when they would complete the undesirable task.

2. Method

Introductory psychology students ($n = 195$) at a private university participated for course credit. Eleven students failed to complete the task, leaving 184 participants (73 male, 111 female).

2.1. Instruments

Time Structure Questionnaire (TSQ; Bond & Feather, 1988). We used four subscales from the 26-item TSQ considered relevant to the timely completion of tasks: Structured Routine (SR) measures tendencies to stay on task; Effective Organization (EO), a desire to do things in an orderly manner; Persistence (Per), which assesses motivation to continue working on tasks until they are completed; and Present Orientation (PO) that measures a tendency to focus on immediate situations. A fifth subscale, Sense of Purpose, is associated more with self-esteem and psychological distress than with time structure, and was therefore not included in this study. Alphas range from .88 to .92, with a test–retest coefficient of .76.

Temporal Orientation Scale (TOS; Jones et al., 1999). The TOS is a brief, 15-item measure of time perspective, highly similar to the Time Perspective Questionnaire (Zimbardo & Boyd, 1999). The TOS is comprised of three 5-item scales. Scores on the Past scale (Pa) are associated with ruminating over regrets. The Present scale (Pr), similar to the TSQ PO subscale, measures a tendency to “live for the moment”. The Future scale (Fu) assesses the tendency to set and adhere to plans aimed at getting work accomplished. Alphas range from .69 to .85.

2.2. Procedure

At the beginning of the semester, participants completed the TSQ and TOS scales. Approximately one month before the last day of the same semester, participants were given a sheet describing two tasks, designed to be either “desirable” or “undesirable”, and to take approximately 30 min to complete. The desirable task required students to read short stories about romantic couples, and to predict which ones were still dating six months later. The undesirable task required people to proofread a page of over 2000 numbers, marking selected digits (e.g., circling all “3’s”). Participants were informed they would be randomly assigned to complete one of the tasks, and rated how enjoyable each task seemed using a 7-point scale; the desirable task was rated as more enjoyable ($M = 5.62$, $SD = 1.29$) than the undesirable task ($M = 2.25$, $SD = 1.63$; $t(180) = 20.6$, $p < .001$). Following this procedure, participants were then given one of the two tasks.

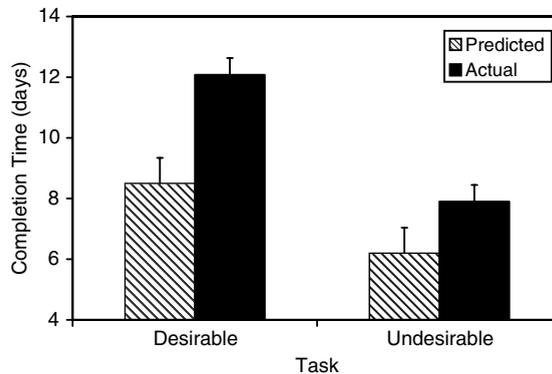


Fig. 1. Predicted and actual completion times as a function of task valence. Prediction bias (difference between predicted and actual) occurs for both desirable and undesirable tasks. However, undesirable tasks are predicted and actually completed sooner. Error bars represent 1 standard error.

Finally, participants were asked to spend a few moments considering their schedule, and to write down exactly when (date, time) they thought they would complete their task, with the stipulation that they had to complete it “during the next two or three weeks”. Participants were instructed to return the completed task to the experimenter’s office. When participants returned with the completed task, they were asked exactly when they had completed it, which was recorded.

3. Results

To determine whether there was a statistically significant prediction bias, a mixed model ANOVA¹ was conducted in which predicted and actual completion times were treated as repeated measures, and task desirability (desirable vs. undesirable) was included as a between-subjects variable. A significant main effect was found for completion time, indicating an overall prediction bias ($F(1, 182) = 19.9, p < .001, \eta^2_{\text{partial}} = .10$). As hypothesized, and regardless of the task, participants tended to be optimistic, taking an average of 2.6 days ($SD = 8.0$) longer than they predicted to complete the task. A significant main effect was also found for task desirability ($F(1, 182) = 16.2, p < .001, \eta^2_{\text{partial}} = .08$). Also as expected, participants given the undesirable task predicted that they would complete it sooner than participants given the desirable task, but they actually did so as well, which was not expected. The lack of a significant interaction indicated that the magnitude of the prediction bias was unaffected by task desirability ($F(1, 182) = 2.35, p = .13$). The main effects of completion time and task desirability can be seen in Fig. 1.

3.1. Correlations among task-completion measures, TSQ, and TOS

Table 1 reports correlations between predicted and actual completion times and the TSQ and TOS scales. Unexpectedly, the correlations were significant only for the undesirable task.

¹ Because predicted and actual times were somewhat skewed, the major analyses were also performed on the square-root transformation of these variables, with similar results.

Table 1

Correlations between completion measures, TSQ and TOS scales for undesirable and desirable tasks

	Undesirable task (<i>n</i> = 94)		Desirable task (<i>n</i> = 76)	
	Predicted	Actual	Predicted	Actual
TSQ				
SR	-.23*	-.35**	.06	.00
EO	-.25*	-.34**	.19	.16
PO	-.10	.15	-.11	.01
Per	-.10	-.27**	.03	.04
TOS				
Fu	-.30**	-.43**	.07	.00
Pa	.25*	-.09	-.03	.03
Pr	-.07	.11	-.04	-.08

* $p < .05$.** $p < .01$.

Table 2

Correlations between TSQ and TOS scales for undesirable (*n* = 94) and desirable (*n* = 76) tasks

		SR	EO	PO	Per	Fu	Pa	Pr
TSQ	SR		.46**	.05	.41**	.57**	-.30*	-.09
	EO	.47**		.04	.36**	.44**	-.21*	-.23*
	PO	-.03	-.06		.04	-.08	-.32*	.10
	Per	.23*	.51**	-.04		.50**	-.24*	.13
TOS	Fu	.52**	.55**	-.01	.42**		-.25*	.02
	Pa	-.08	-.21*	-.48**	-.12	-.08		-.13
	Pr	-.05	-.03	.27*	-.01	-.05	-.19	

* $p < .05$, ** $p < .01$. Lower = Undesirable task; Upper = Desirable task.

Negative correlations were found for the SR, EO, Per, and Fu measures. The PA scale correlated positively with predicted completion; the Pr scale had a very small correlation with actual completion, but it was not significant.

Correlations among the TSQ and TOS scales are reported in Table 2. Moderate positive correlations were found between the SR, EO, and Per scales. However, the PO scale was unrelated to the other TSQ instruments. Consistent with previous research (Jones et al., 1999), the TOS scales were mostly uncorrelated with one another. Moderate positive correlations were found among the Fu, SR, EO and Per scales. Pa correlated negatively with all four TSQ scales, indicating the *absence* of a motive to structure one's time. Pr correlated minimally with the TSQ measures, perhaps because it involves valuing fun over work (Lasane & Jones, 2000). No significant differences were found between these correlations due to task condition ($p > .05$).

3.2. Underlying dimensionality of the TSQ and TOS

To clarify the relationships between the TSQ and TOS scales, responses to these measures were submitted to iterated principal-axis factor analysis with oblique (promax) rotation, using the

Table 3
Factor loadings of the TSQ and TOS scales after oblique rotation ($N = 170$)

Scale	Factor I	Factor II
	Yuppie traits	Hippie traits
TOS Fu	.73	–.04
TSQ EO	.68	–.03
TSQ SR	.64	–.03
TSQ Per	.57	.05
TSQ PO	–.07	.55
TOS Pr	–.10	.35
TOS Pa	–.18	–.54

Factor loadings are listed in the descending order magnitude of their dominant loading.

squared multiple correlation as the communality estimate. Because correlations between the TOS and TSQ were similar across task conditions, these data were combined. Three criteria (Russell, 2002) determined the number of factors to retain: (1) Cattell's (1958) scree test; (2) amount of common variance explained by the factors; and (3) psychological meaningfulness of the rotated factors. The scree plot of the eigenvalues (1.80, .70, .07, .01...) suggested two factors, which accounted for >95% of the common variance, should be extracted (see Table 3).

After rotation, the two factors accounted for nearly 100% of the common variance, and were modestly correlated ($r = .14$). The first rotated factor consisted of Fu, EO, SR, and Per, with loadings $\geq .55$ and no salient ($> .30$) secondary loadings. These four scales assessed intentions to meet goals, be persistent, and work hard – motives related to accomplishment and “getting ahead”. The second factor was defined by loadings $\geq .35$ that were positive for PO and Pr, but negative for Pa; none of these instruments had salient dual loadings. The two positively loading scales described tendencies to “enjoy the moment” and not worry about the future, whereas the negative loading for Pa indicated an *absence* of regrets about the past. Thus, this factor reflected a lack of concern with past mistakes or future problems.

These two factors were quite consistent with the “work focused”, “work unfocused” factors that had been hypothesized to underlie the TSQ and TOS measures. In labeling the two factors with meaningful shorthand descriptions we thought *yuppie traits* was particularly apt (though amusing) for the first factor, and *hippie traits* was an accurate (and also amusing) descriptive label for the second factor.

3.3. Relationships between yuppie traits, hippie traits, and task-completion measures

To evaluate relationships between the yuppie and hippie factors and the task-completion measures, structural equation modeling was conducted using maximum likelihood estimation. The first model was designed to assess the nature of relationship between predicted and actual completion, and also between the two factors with the completion variables. Because no significant relationships were found between these measures for the desirable task, path models were only developed for the undesirable condition. Acceptable model fit was determined based on non-significant chi-square, Comparative Fit Index (CFI) and Non-Normed Fit Index (NNFI) $\geq .95$,

McDonald's centrality Fit Index (MFI) $\geq .90$, and Root Mean Standard Error of Approximation (RMSEA) $\leq .06$ (Hu & Bentler, 1999).

Following the "two-step approach" to latent variable modeling, a measurement model was first developed to test overall goodness of fit (GOF), which included the latent yuppie and hippie factors and predicted and actual completion. The latent variable indicators were the scales that defined these factors in the exploratory analysis (see Table 3). GOF indices for the measurement model were excellent ($\chi^2 = 21.88$ (25), $p > .05$ ns; CFI, NNFI, MFI = 1.0; RMSEA = .00, 90% CI = .00, .06), and all factor loadings were significant ($p > .01$), indicating that a well fitting model could be developed.

First, a saturated model was tested, which included paths leading to each measured variable from the two latent variables, and a path projecting from predicted to actual completion, for which all direct and indirect paths were significant ($p < .01$). Given the possibility that the significant relationships between the latent variables and actual completion were mediated by predictions, Sobel tests (Preacher & Hayes, 2004; Sobel, 1982) were conducted on path coefficients derived from separate analyses of each latent variable with the two measured variables (MacKinnon & Dwyer, 1993; MacKinnon, Warsi, & Dwyer, 1995; Preacher & Hayes, 2004). If the Sobel tests indicated a mediated effect was present, it was also expected that the effect of the initial variable on the outcome variable would be reduced when the mediator was included as compared to when the mediator was absent (Kenny, Kashy, & Bolger, 1998; MacKinnon, 2000; Shrout & Bolger, 2002).

In following the aforementioned procedure, Sobel tests indicated that effect of the latent yuppie variable on actual completion was not significantly mediated through predicted completion ($z = 1.77$, $p > .05$, ns); therefore, its indirect effect path was deleted. However, the indirect effect of the hippie factor was significant ($z = 2.05$, $p < .05$), and thus retained. In further testing the mediated effect, inclusion of the mediator was unexpectedly found to result in a *strengthening* of the direct hippie effect, suggesting that predicted completion was effectively a suppressor variable (Pedhazur, 1997). Upon further examination of this result, the coefficients for the direct and indirect paths were found to be oppositely signed, providing further evidence of suppression. Given that the direct hippie path did not diminish in magnitude with the addition of the mediator, both the direct and indirect hippie paths were retained.

The final model (see Fig. 2), had excellent fit ($\chi^2 = 29.34$ (26), $p > .05$ ns; CFI = .98, NNFI = .97; MFI = .98; RMSEA = .04, 90% CI = .00, .09). Not surprisingly, predicted completion directly affected actual completion ($t = 3.36$; $p < .01$), such that later predictions were associated with later actual times. The yuppie factor was directly associated with shorter actual completion times ($t = -4.99$; $p < .01$). However, the yuppie effect was not mediated by predictions. Interestingly, the hippie factor was associated with earlier predictions ($t = -2.83$; $p < .01$), but later actual completion ($t = 2.57$; $p < .01$).

To more directly show how hippie and yuppie traits affected prediction biases for the undesirable task, separate measurement and path models were developed for the trait factors and a "bias" variable, derived by subtracting each participant's predicted completion time from his or her actual time (see Fig. 3). Fit for the measurement model was excellent ($\chi^2 = 20.47$ (20), $p > 1.0$ ns; CFI = 1.00; NNFI = 1.00; MFI = .99; RMSEA = .02). For the subsequent path model, a negative path was found for the yuppie factor ($t = -3.46$; $p < .01$) whereas a positive path of nearly equal magnitude was found for the hippie factor ($t = 3.38$; $p < .01$). As previously

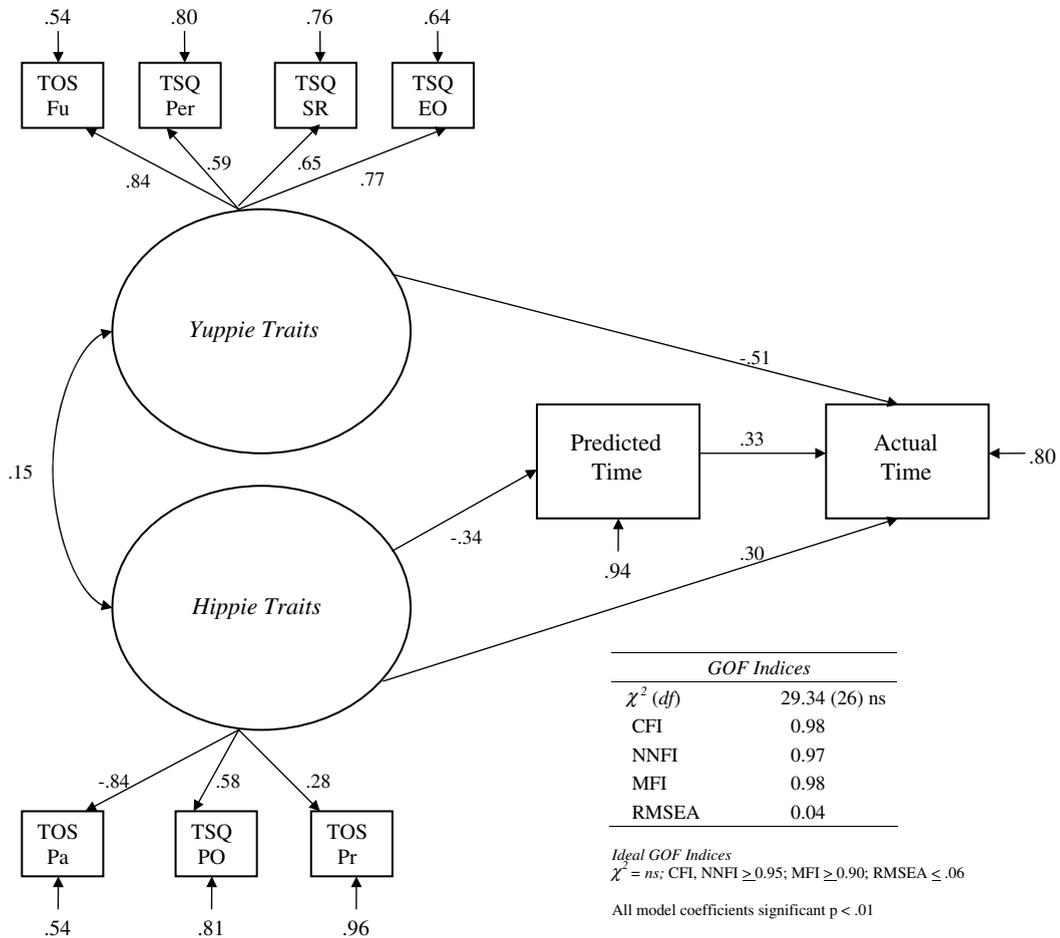


Fig. 2. Diagram of latent variable path model for the undesirable task ($n = 94$). Hippie traits were associated with longer completion times and with shorter prediction times, both of which contribute to a greater prediction bias. Yuppie traits were associated with shorter completion times, but were unrelated to prediction times.

noted, overall, all participants were biased optimistically (i.e., task took longer than expected). Therefore, the negative path coefficient for the yuppie factor indicated that yuppie traits were related to *lesser* optimistic bias, whereas the positive path for the hippie factor indicated that these traits corresponded with *greater* optimistic bias.

4. Discussion

The major goal of the present study was to evaluate relationships between individual differences in time structure and temporal orientation and errors in predicting when future tasks, varying in desirability, will be completed. Additionally, the underlying dimensionality of time structure and temporal orientation was examined. Consistent with previous research, overall, participants were

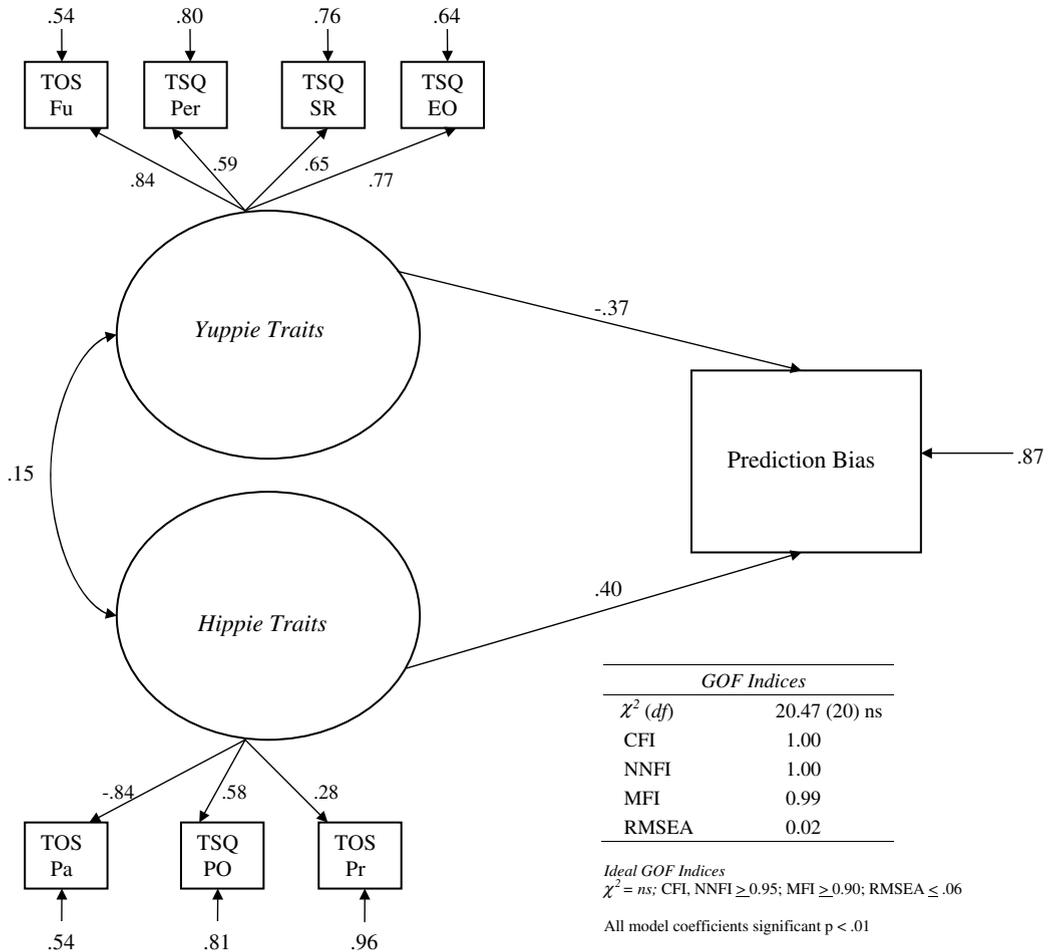


Fig. 3. Diagram of latent variable path model for the unpleasant task ($n = 94$). Although overall, all participants' prediction biases were optimistic, yuppie traits were associated with lesser optimistic biases whereas hippie traits were related to greater optimistic biases.

biased optimistically in predicting when they would complete their task, regardless of its desirability.

Finding that the undesirable task elicited even more optimistic predictions than the desirable task was consistent with previous research that suggests when individuals are given unenjoyable tasks they may set early deadlines to help overcome procrastination (Ariely & Wertenbroch, 2002; Buehler et al., 1997). Although finding that participants also tended to *actually* complete the undesirable task sooner was not hypothesized, it is consistent with Loewenstein and Prelec's (1993) observation that people prefer events to start poorly and then improve over time rather than start out well and gradually worsen.

Consistent with expectations, factor analysis identified two dimensions that underlie measures of time structure and temporal orientation labeled yuppie and hippie traits. Yuppie traits reflected

a tendency to be goal-oriented, hard-working, and punctual, whereas hippie traits involved a “live for the moment” philosophy with few concerns for the future or regrets about the past. Path analyses demonstrated that for the undesirable task, yuppie traits were associated with completing the task sooner and consequently less optimistic bias. In contrast, hippie traits were related to earlier predicted times, but later completion times, resulting in greater optimistic bias. Finding that hippie traits were associated with both earlier predictions and later completion most likely reflected tendencies to think less about future outcomes and to be more easily distracted by opportunities for recreation (e.g., social functions) (Lasane & Jones, 2000). In future research, it would be worthwhile to investigate whether individual differences in other constructs that involve being focused on work, such as conscientiousness and achievement motivation, also correspond with prediction biases.

Unexpectedly, significant relationships between individual differences in time structure and temporal orientation were found only for the undesirable task. Most tasks in the planning bias literature have been relatively unpleasant, work-like tasks (e.g., Buehler et al., 1994; Koole & Spijker, 2000; Kruger & Evans, 2004). In contrast, the desirable task may not have been perceived as work by “yuppies”, who value hard work and persistence, or by “hippies”, who may have even viewed the task as a pleasant distraction from other more tedious tasks (e.g., homework or daily chores).

In summary, the present study investigated how scores on the time structure questionnaire (TSQ) and temporal orientation scale (TOS), and task desirability are related to errors in predicting when tasks will be completed. Factor analysis of the TOS and TSQ identified two trait factors: yuppie traits corresponded with perceiving oneself as punctual, hard-working, and goal-oriented, while hippie traits involved tendencies to live for the moment. Overall, individuals tended to optimistically underestimate when they would complete both tasks. However, for the undesirable task, yuppie traits corresponded with a lesser optimistic bias, whereas a greater optimistic bias was associated with hippie traits. How individual differences in these personality factors correspond with biases in predicting when tasks will be completed will be important to investigate further in future research.

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