# Relations between chronic regulatory focus and future time perspective: Results of a cross-lagged structural equation model

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## ARTICLE INFO

## ABSTRACT

Future time perspective – the way individuals perceive their remaining time in life – importantly influences socio-emotional goals and motivational outcomes. Recently, researchers have called for studies that investigate relationships between personality and future time perspective. Using a cross-lagged panel design, this study investigated effects of chronic regulatory focus dimensions (promotion and prevention orientation) on future time perspective dimensions (focus on opportunities and limitations). Survey data were collected two times, separated by a 3 month time lag, from 85 participants. Results of structural equation modeling showed that promotion orientation had a positive lagged effect on focus on opportunities, and prevention orientation had a positive lagged effect on focus on limitations.

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## 1. Introduction

Future time perspective (FTP) – the way individuals perceive their remaining time in life – importantly influences socio-emotional goals and motivational outcomes above and beyond chronological age (Carstensen, 2006). For example, using a sample of 480 adults between 20 and 90 years of age, Lang and Carstensen (2002) showed that FTP significantly correlated with life goals (social acceptance: $r = .17$, emotional regulation: $r = -.16$, $ps < .01$) and partner preferences (friends: $r = .22$, family relative: $r = -.19$, $ps < .01$) after controlling for age, gender, occupational prestige, education, depression, and somatic complaints. In the work context, Zacher, Heusner, Schmitz, Zwierzanska, and Frese (2010) used a sample of 168 employees between 19 and 64 years and found that employee self-ratings of FTP significantly predicted peer-ratings of employees' work performance ($\beta = .29$, $p < .01$) after controlling for age and job characteristics. Furthermore, using a sample of 84 small business owners between 24 and 74 years, Gielnik, Zacher, and Frese (in press) found that FTP significantly predicted business owners' venture growth ($\beta = .38$, $p < .01$) after controlling for prior venture growth, age, gender, physical and mental health, industry, and firm size. Finally, Bal, Jansen, van der Velde, de Lange, and Rousseau (2010) showed that FTP was a significant predictor ($\beta = .37$, $p < .01$) of developmental fulfillment in the work context (e.g., participation in decision making, training, and career support) in a sample of 176 post-retirement employees

between 65 and 79 years. In sum, these findings indicate that FTP has meaningful effects on socio-emotional and motivational outcomes across different samples of varying ages. Despite the importance of FTP, research on personality characteristics as predictors of FTP has so far been limited and inconclusive (Cate & John, 2007; Zacher & Frese, 2009). This led Cate and John (2007) to ask the question: "What personality variables, if any, correlate with focusing on opportunities and focusing on limitations?" (p. 200). Their call for research has so far not been answered. We argue that it is important to investigate relevant personality characteristics as predictors of FTP, because FTP leads to significant outcomes in various life domains.

The goal of this study, therefore, was to investigate the influence of chronic regulatory focus (Higgins, 1997; Lockwood, Chasteen, & Wong, 2005) – a construct primarily investigated in social and personality psychology – on FTP, a construct developed in the aging and lifespan psychology literature (Carstensen, Isaacowitz, & Charles, 1999; Cate & John, 2007). *Chronic regulatory focus* is defined as individuals' characteristic way to approach goals, and consists of two basic, independent self-regulatory orientations (Higgins, 1997). *Promotion orientation* involves the sensitivity to the presence or absence of positive outcomes and is characterized by strategies of approaching gains and avoiding non-gains. *Prevention orientation* involves the sensitivity to the presence or absence of negative outcomes and is characterized by strategies of avoiding losses and approaching non-losses. FTP has been defined as the way individuals perceive their remaining time in life (Cate & John, 2007). Cate and John (2007) distinguished two dimensions of FTP. *Focus on opportunities* describes how many

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new goals, plans, and possibilities individuals believe to have in their future. *Focus on limitations* describes how many restrictions and constraints individuals perceive in their future. In contrast to trait-like constructs such as time orientation (Zimbardo & Boyd, 1999), FTP as defined by Cate and John (2007) is a more flexible construct that changes with age and environmental conditions (cf. Zacher & Frese, 2009). Despite of age-related changes in mean levels of FTP, research indicates that this conceptualization of FTP has the same meaning across different age groups. Specifically, Cate and John (2007) investigated Carstensen's FTP scale (e.g., Lang & Carstensen, 2002) in a sample of 285 participants that consisted of three age groups: a young adult sample between 18 and 25 years, an early middle-aged sample between 41 and 49 years, and a late middle-aged sample between 50 and 59 years. These authors showed that a two-factor model (with focus on opportunities and focus on limitations as two distinct dimensions of FTP) had a significantly better fit than a one-factor model in all three age groups. In addition, Cate and John (2007) reported that the factor loadings were very similar across the three age groups; they concluded: "Thus, in terms of the items defining each factor, the meaning of the factors did not vary with age" (p. 195). This is consistent with Carstensen (2006), who suggested that "consideration of time horizons can offer insights into the ways in which younger and older people differ, but also show that behavioral differences are often driven *by the same underlying mechanisms*" (p. 1915, italics added). Taken together, there is evidence that FTP, as conceptualized in the current study, has the same meaning across different age groups.

Chronic regulatory focus and FTP each consist of two distinct dimensions which appear conceptually related (Freund & Ebner, 2005). Specifically, promotion orientation and focus on opportunities are concerned with positive, growth-related aspects of psychological functioning, whereas prevention orientation and focus on limitations concentrate on negative outcomes. Despite these apparent theoretical similarities, no study to date has examined the causal relations between these constructs. This study contributes to the literature by investigating the effects of chronic regulatory focus dimensions on FTP dimensions using a cross-lagged panel design.

Freund and Ebner (2005) proposed that individuals' FTP might contribute to differences in goal orientations. For example, they suggested that younger adults' higher FTP might lead to a motivational orientation toward promoting gains. In contrast to this assumption, we expect that individuals' chronic regulatory focus affects their FTP and not vice versa. Specifically, we suggest that a strong promotion orientation leads to a high focus on opportunities, whereas a strong prevention orientation should result in a high focus on limitations. We expect that chronic regulatory focus influences how people perceive their future, because FTP is a more flexible construct that has been shown to change across the lifespan and to be influenced by environmental characteristics (Cate & John, 2007; Zacher & Frese, 2009).

People with a strong promotion orientation are generally more sensitive to positive outcomes and use strategies to pursue potential gains and successes (Higgins, 1997). Therefore, we expect that they also perceive their future possibilities and goals more positively. In contrast, prevention-oriented people are generally more sensitive to negative outcomes, and use strategies aimed at avoiding losses or failures (Higgins, 1997). Consequently, they can be expected to focus more strongly on the potential losses and limitations that they may encounter in their personal future. Based on these assumptions, we propose two hypotheses.

*Hypothesis 1*: Promotion orientation has a positive cross-lagged effect on focus on opportunities.

*Hypothesis 2*: Prevention orientation has a positive cross-lagged effect on focus on limitations.

## 2. Method

### 2.1. Participants and procedure

The data used in this 2-wave panel study came from 85 Dutch employees employed by one company in the Netherlands. Fifty-three (62.4%) of the participants were male, ages ranged from 22 to 61 years, and the average age was 43.41 years (*SD* = 10.68). Two participants had a primary school degree (2.4%), 44 completed high school (51.2%), 35 (41.2%) completed a lower vocational education, and three (3.5%) respondents had a bachelors degree (one participant did not indicate his or her education).

In November 2008 and February 2009, an online survey link was distributed among 170 employees of a health-care distribution company. For Time 1, 127 employees (75%) responded. For both Time 1 and Time 2, 85 employees (50%) provided complete data which were used in the analyses. Non-parametric Mann–Whitney-U-tests showed that participants who responded at Time 1, but not at Time 2, did not differ from participants who responded at both Time 1 and 2 with regard to all of the study variables.

### 2.2. Measures

Our measures were translated from the original measures into Dutch, and subsequently back-translated into English by an English native speaker fluent in Dutch and a Dutch native speaker fluent in English. This procedure is similar to those used in other studies on FTP and regulatory focus (e.g., Brenninkmeijer, Demerouti, le Blanc, & van Emmerik, 2010; Zacher & Frese, 2009).

#### 2.2.1. Chronic regulatory focus

We assessed promotion and prevention orientation with a regulatory focus measure developed by Lockwood, Jordan, and Kunda (2002). The measure includes nine items measuring general promotion orientation (e.g., "I frequently imagine how I will achieve my hopes and aspirations") and nine items measuring general prevention orientation (e.g., "In general, I am focused on preventing negative events in my life"). The word "academic" was removed from two items included in the original scale (e.g., "I frequently think about how I will achieve academic success"). The responses were given on 7-point scales ranging from 1 (*not at all true of me*) to 7 (*very true of me*). Cronbach's alphas were .83 (Time 1) and .85 (Time 2) for promotion orientation and .78 (Time 1) and .81 (Time 2) for prevention orientation.

#### 2.2.2. Future time perspective

We measured focus on opportunities and focus on limitations with three items each, which were taken from the FTP scale developed by Lang and Carstensen (2002). Example items are "Many opportunities await me in the future" (focus on opportunities) and "There are only limited possibilities in my future" (focus on limitations). Ratings were made on 7-point scales with endpoints labeled 1 (*absolutely not*) to 7 (*absolutely*). Cronbach's alphas were .90 (Time 1) and .86 (Time 2) for focus on opportunities and .66 (Time 1) and .67 (Time 2) for focus on limitations. Cate and John (2007) recently provided evidence that the items from Lang and Carstensen's (2002) scale reliably assess these two distinct dimensions of FTP.

### 2.3. Analysis

We used a cross-lagged structural equation model to examine our hypotheses. Given the small sample size, and considering the problems caused by estimating the parameters of all items

(insufficient power and under-identification, Schumacker & Lomax, 1996), we examined the structural model with scale scores treated as latent variables (cf. de Lange, Taris, Kompier, Houtman, & Bongers, 2004). This approach is recommended for studies with small samples, as it reduces the number of parameters to be estimated compared to a full structural equation model. According to Anderson and Gerbing (1988), the use of maximum likelihood estimation does not result in biased parameter estimates that are of practical importance when $N = 50$ or greater.

We followed the two-step approach suggested by James, Mulaik, and Brett (1982), and first tested the measurement models at both measurement times before fitting the structural models. These analyses showed that the measurement models were consistent across time. For Time 1, a four-factor model had a better fit ($\chi^2[246] = 415.45$, $p < .01$; RMSEA = .09; CFI = .77) than a one-factor model ($\chi^2[252] = 689.152$, $p < .01$; RMSEA = .14; CFI = .40). For Time 2, a four-factor model also had a better fit ($\chi^2[246] = 421.68$, $p < .01$; RMSEA = .09; CFI = .78) than a one-factor model ($\chi^2[252] = 742.18$, $p < .01$; RMSEA = .15; CFI = .38).

To test our hypotheses, we fitted five competing structural models to the data. First, a model with temporal stabilities (autocorrelations), but without cross-lagged paths (Model $M_1$) was specified. Second, this stability model was compared with four more complex models: (a) a model with cross-lagged paths from Time 1 regulatory focus dimensions to their corresponding Time 2 FTP dimensions (Model $M_2$); (b) a model with cross-lagged paths from Time 1 FTP dimensions to their corresponding Time 2 regulatory focus dimensions (i.e., the reversed causal Model $M_3$); (c) a model with both cross-lagged paths in which the normal and reversed effects were constrained to be equal in order to further determine the relative dominance of the normal cross-lagged effects in $M_2$ and $M_3$; and finally (d) a model with both cross-lagged paths (Model $M_5$) representing unconstrained reciprocal effects between regulatory focus and FTP dimensions. Based on Bentler and Bonett (1980) and Browne and Cudeck (1993), we assumed that CFI values above .90 and RMSEA values below .10 represent an adequate model fit. In addition, we used the difference between Chi-square statistics to test whether the fit of a more complex model was significantly better than the fit of a simpler model. We controlled for age and education because previous research suggested that they predict FTP (Zacher & Frese, 2009). Finally, we included the concurrent relations between the latent variables in the models (Shingles, 1985).

## 3. Results

The descriptive statistics and intercorrelations of the study variables are shown in Table 1. The test–retest coefficients were higher for promotion orientation and prevention orientation (both

$r$s = .72, $p < .01$) than for focus on opportunities ($r = .62$, $p < .01$) and focus on limitations ($r = .50$, $p < .01$). These findings are consistent with our assumption that FTP is less stable across time than chronic regulatory focus. Table 1 further showed that age was negatively, but not significantly, related to promotion orientation at Time 1 ($r = -.17$, $ns$), and negatively and significantly related to promotion orientation at Time 2 ($r = -.32$, $p < .01$). Age was negatively related to focus on opportunities at both Time 1 and Time 2 ($r = -.53$ and $r = -.44$, respectively, $p$s < .01). The correlations between age and prevention orientation at Time 1 and Time 2 were not significant ($r$s = .01 and $-.06$, $ns$). Age was positively related to focus on limitations at Time 1 ($r = .33$, $p < .01$), but not significantly related to focus on limitations at Time 2 ($r = .07$, $ns$). Education was only positively and significantly related to focus on opportunities at Time 2 ($r = .28$, $p < .01$). Finally, Table 1 shows that promotion orientation at Time 1 and Time 2 was positively related to focus on opportunities at Time 1 and Time 2 ($r$s between .40 and .55, $p$s < .01). Prevention orientation at Time 1 and Time 2 was positively related to focus on limitations at Time 1 and Time 2 ($r$s between .27, $p < .05$, and .53, $p < .01$).

The model fit indices and the results of the model comparisons are shown in Table 2. The first chi-square difference test showed that the difference between the stability model ($M_1$) and the model with cross-lagged effects from regulatory focus to FTP was significant ($M_1$ vs. $M_2$: $\Delta\chi^2(2) = 17.77$, $p < .01$). This means that the unconstrained model with lagged effects ($M_2$) better accounts for the data than the constrained model with no lagged effects ($M_1$). In other words, we obtained statistical evidence that Time 1 regulatory focus influenced changes in FTP from Time 1 to Time 2.

The second chi-square difference test showed that the difference between the stability model and the model with cross-lagged structural paths from Time 1 FTP to Time 2 regulatory focus was not significant ($M_1$ vs. $M_3$: $\Delta\chi^2(2) = 4.18$, $ns$). Thus, model $M_3$ had no better statistical fit than model $M_1$. This indicates that FTP did not influence changes in regulatory focus from Time 1 to Time 2.

The third chi-square difference test showed that the difference between the stability model and the model with reciprocal cross-lagged structural paths, which were constrained to be equal, was significant ($M_1$ vs. $M_4$: $\Delta\chi^2(1) = 12.08$, $p < .01$). This significant difference was likely due to the cross-lagged effect of regulatory focus on FTP (as model $M_2$ fit the data significantly better than model $M_1$) but not due to the reversed cross-lagged effect of FTP on regulatory focus (as model $M_3$ did not fare significantly better than model $M_1$).

The chi-square difference test between the stability model and the model with the reciprocal cross-lagged paths which were not constrained to be equal was also significant ($M_1$ vs. $M_5$: $\Delta\chi^2(4) = 20.83$, $p < .01$). Again, this significant difference was likely due to the cross-lagged effect of regulatory focus on FTP, but not

**Table 1**
Means (M), standard deviations (SD), and intercorrelations of study variables.

| Variable | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Age T1 | 43.41 | 10.68 | – | | | | | | | | | |
| 2. Education T1 | 3.29 | 1.21 | −.37** | – | | | | | | | | |
| 3. Promotion orientation T1 | 5.20 | 1.33 | −.17 | .12 | (.83) | | | | | | | |
| 4. Promotion orientation T2 | 5.19 | 1.29 | −.32** | .20 | .72** | (.85) | | | | | | |
| 5. Prevention orientation T1 | 3.20 | 1.21 | .01 | −.09 | .36** | .35** | (.78) | | | | | |
| 6. Prevention orientation T2 | 3.22 | 1.17 | −.06 | −.10 | .17 | .25* | .72** | (.81) | | | | |
| 7. Focus on opportunities T1 | 3.71 | 1.50 | −.53** | .20 | .47** | .40** | −.02 | −.11 | (.90) | | | |
| 8. Focus on opportunities T2 | 3.67 | 1.37 | −.44** | .28** | .47** | .55** | .13 | .01 | .62** | (.86) | | |
| 9. Focus on limitations T1 | 2.97 | 1.13 | .33** | .03 | .13 | .14 | .27* | .28** | −.24* | −.15 | (.66) | |
| 10. Focus on limitations T2 | 3.08 | 1.19 | .07 | .01 | .02 | −.01 | .41** | .53** | −.17 | −.09 | .50** | (.67) |

*Note.* $N = 85$. T1 = Time 1; T2 = Time 2. Reliability estimates ($\alpha$) are shown in parentheses along the diagonal.
$^*p < .05$. $^{**}p < .01$.

**Table 2**
Fit indices and chi-square difference tests of nested structural equation models.

| Model | $\chi^2$ | df | CFI | RMSEA | AIC | Comparison | $\Delta\chi^2$ | $\Delta df$ |
|---|---|---|---|---|---|---|---|---|
| No cross-lagged ($M_1$) | 33.55** | 12 | .93 | .15 | 139.55 | | | |
| Cross $RF_{T1}$–$FTP_{T2}$ ($M_2$) | 15.78 | 10 | .98 | .08 | 125.78 | $M_1$ vs. $M_2$ | 17.77** | 2 |
| Cross $FTP_{T1}$–$RF_{T1}$ ($M_3$) | 29.36** | 10 | .94 | .15 | 139.36 | $M_1$ vs. $M_3$ | 4.18 | 2 |
| Both cross, constrained equal ($M_4$) | 21.46* | 11 | .97 | .11 | 129.46 | $M_1$ vs. $M_4$ | 12.08** | 1 |
| Both cross ($M_5$) | 12.72 | 8 | .98 | .08 | 126.72 | $M_1$ vs. $M_5$ | 20.83** | 4 |
| | | | | | | $M_2$ vs. $M_5$ | 3.06 | 2 |
| | | | | | | $M_3$ vs. $M_5$ | 16.65** | 2 |
| | | | | | | $M_4$ vs. $M_5$ | 8.74* | 3 |

*Note.* RF = regulatory focus; FTP = future time perspective; T1 = Time 1; T2 = Time 2.
\* $p < .05$. \*\* $p < .01$.

due to the reversed cross-lagged effect of FTP on regulatory focus. This assumption was further supported by the finding that the model fit did not improve when reversed structural paths were added to the conventional paths ($M_2$ vs. $M_5$: $\Delta\chi^2(2) = 3.06$, *ns*). In contrast, there was a clear improvement in model fit when the conventional structural paths were added to the reversed paths ($M_3$ vs. $M_5$: $\Delta\chi^2(2) = 16.65$, $p < .01$). Finally, the model fit improved when the model with unconstrained reciprocal paths was compared with the model with reciprocal paths constrained to be equal ($M_4$ vs. $M_5$: $\Delta\chi^2(3) = 8.74$, $p < .05$).

Generally, in terms of chi-square relative to the degrees of freedom, model $M_2$ showed the best fit of all models (see Table 2). Model $M_2$ also had a relatively good fit when the most important practical fit indices were reviewed (i.e., CFI = .98, RMSEA = .08, AIC = 125.78). As education did not significantly predict any of the Time 2 variables, we eliminated it from the final model which is shown in Fig. 1. Hypothesis 1 was supported by a positive and significant cross-lagged effect of promotion orientation on focus on opportunities (.25, $p < .01$). Hypothesis 2 was supported by a positive and significant cross-lagged effect of prevention orientation on focus on limitations (.32, $p < .01$).

## 4. Discussion

The way individuals perceive their remaining time in life has been shown to influence important life outcomes; however, researchers have so far neglected the investigation of personality predictors of FTP. The goal of this study was to investigate the influence of chronic regulatory focus on FTP using a cross-lagged structural equation model. Consistent with our expectations, the results of the best fitting model showed that promotion orientation had a positive cross-lagged effect on focus on opportunities, and that prevention orientation had a positive cross-lagged effect on focus on limitations. Thus, our findings clarify the complex relationship between motivational orientations such as chronic regulatory focus and the more flexible concept of FTP (Freund & Ebner, 2005): regulatory focus appears to influence FTP and not vice versa. Future research, however, could investigate causal influences of FTP on less stable forms of regulatory focus. It may be that both age and FTP influence a momentary regulatory focus.

Whereas age was negatively related to promotion orientation and focus on opportunities, age was largely unrelated to prevention orientation and focus on limitations. One possible reason for these findings may be the restriction in age range in our sample. It may be that age-related changes in prevention orientation and focus on limitations become apparent only in late middle age and beyond (i.e., starting roughly with 60 years of age). This interpretation is consistent with findings by Cate and John (2007), which showed that focus on limitations did not increase until late

middle age whereas focus on opportunities decreased already in early middle age.

### 4.1. Limitations and future research

One limitation of this study is that our sample was relatively small and participants came from only one company and had a limited age range (i.e., working age adults). Future research should investigate causal relations between regulatory focus and FTP using larger and more representative samples with a wider age range. Second, the time interval of three months may have been too short to study meaningful changes in regulatory focus and FTP. Future research should investigate participants across longer time intervals such as one or more years. Third, our measures of regulatory focus and FTP may be criticized. For example, Summerville and Roese (2008) showed that the scale by Lockwood et al. (2002) was largely uncorrelated with a different measure of chronic regulatory focus by Higgins et al. (2001). Fourth, the reliabilities of our three-item focus on limitations measure were below conventional standards. Future research should use additional items to measure focus on limitations (cf. Cate & John, 2007). It is unlikely, however, that the lack of cross-lagged relations from FTP to regulatory focus is due to these low reliabilities as the results were consistent with our theoretical assumptions. In addition, focus on opportunities had a better reliability and also did not predict promotion orientation.

Finally, future research could investigate FTP dimensions that are different from Cate and John's (2007) two-dimensional conceptualization, for example directionality, density, extension, affectivity, and coherence (Seijts, 1998). Future studies could also include additional relevant control and predictor variables, such as trait optimism (Scheier & Carver, 1985). Zacher and Frese (2011) suggested that trait optimism and FTP are conceptually distinct. They argued that FTP does not represent a stable optimistic bias but rather a flexible form of realistic optimism, that is, a tendency to maintain a positive outlook within the constraints of perceived reality.

### 4.2. Theoretical and practical implications

Our findings extend research on motivational orientations (Freund and Ebner, 2005) by clarifying the causal relations among regulatory focus and FTP. In contrast to Freund and Ebner's (2005) assumptions that FTP may influence regulatory focus over time, we showed that promotion orientation had a positive cross-lagged effect on focus on opportunities, and prevention orientation had a positive cross-lagged effect on focus on limitations.

Our findings also suggest a refinement of socioemotional selectivity theory (Carstensen et al., 1999). Carstensen and colleagues have so far conceptualized FTP as a unidimensional construct ranging from unlimited to limited time left. Using the measure by Lang and Carstensen (2002), we showed that its two dimensions
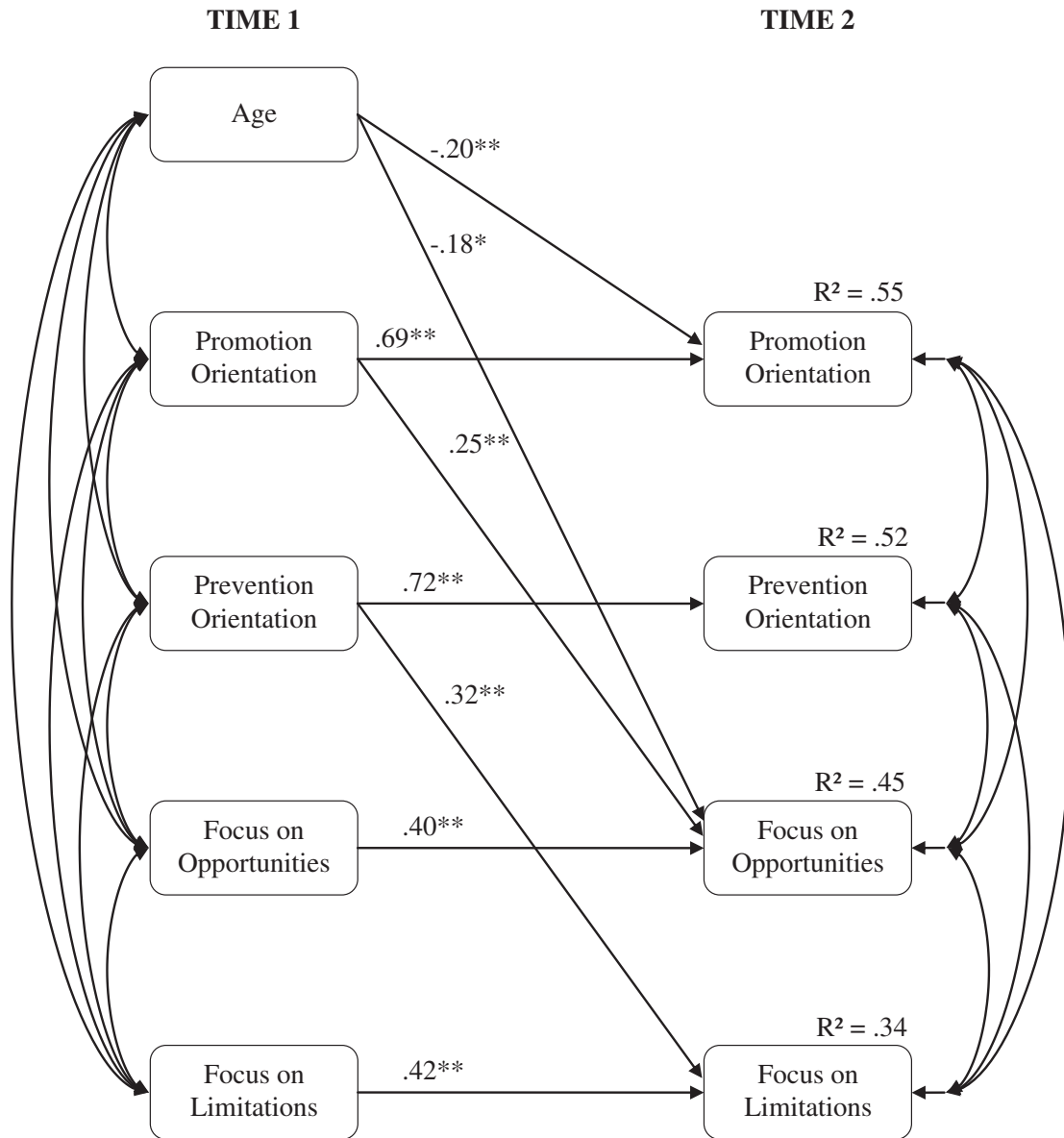
**TIME 1**　　　　　　　　　　　　　　　　　**TIME 2**



**Fig. 1.** Final cross-lagged structural equation model with standardized coefficients ($M_2$). $N = 85$. Coefficients of concurrent correlations and non-significant paths are not depicted. Fit statistics: $\chi^2(10) = 15.12$, ns. CFI = .98, RMSEA = .08. $^*p < .05$. $^{**}p < .01$.

(focus on opportunities and limitations) were predicted by two dimensions of regulatory focus. Thus, future research needs to clarify the role of FTP as a multidimensional construct in socioemotional selectivity theory. Finally, our study extends Higgins' (1997) regulatory focus theory by showing that regulatory focus influences how individuals perceive their remaining time in life.

Our research also has some practical applications. As life expectancies continue to increase, it is important that older adults focus more on opportunities than on limitations in their remaining life time. The potential benefits of a high focus on opportunities range from subjective well-being (cf. Cate and John, 2007) to increased work motivation and performance (Zacher et al., 2010). Researchers have suggested that increasing job control and complexity (Zacher and Frese, 2009) and improving mental health (Gielnik et al., in press) may help to maintain a focus on opportunities with increasing age. Assessing regulatory focus can be a useful practice for health and occupational counseling practitioners to identify those individuals in need of increased support and to retain an active and aging workforce.

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