

# Confident person, happy life?

## A longitudinal investigation of the reciprocity between trait optimism and general life satisfaction

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### ABSTRACT

Optimism, a tendency of being focused on positive versus negative expectations for the future, has been well-documented in literature that positively affects various outcomes, such as physical and mental health, career success as well as interpersonal relationship. While psychological research has a long tradition to treat trait optimism as a disposition with limited variability, recent personality studies support a dynamic personality theory – personality traits fluctuate across the whole life span, and are heavily predicted by environments and personal experiences. Given the vital role of trait optimism in several cognitive and social processes, a better understanding of the variation of optimism and its potential antecedents is of vital significance. Abundant previous research that used cross-sectional data has suggested a secure connection between trait optimism and general life satisfaction. At the same time, as a manifestation of the emotions of daily life events, life satisfaction may also change optimism. This study, with a longitudinal design, examined the association of general life satisfaction and trait optimism over seven years, and pay special attention to test whether general life satisfaction truly affects the level of optimism. A newly developed Random Intercept Cross Lagged Panel Model (RI-CLPM) is applied that effectively disentangles the between- and within- relationships and that offers a potential causal perspective. The results replicated previous findings by illustrating the positive effect of optimism on life satisfaction. Furthermore, interestingly, the effect of general life satisfaction on optimism was estimated to be negative. We offered plausible explanations via the gambler's fallacy. Future research can further explore the influence mechanism of life satisfaction on optimism.

**Keywords:** *Optimism, life satisfaction, causal relationships*

### 1. INTRODUCTION

Optimism has long been a trait that psychologists extensively study. The trait optimism is conceptualized as the hopeful expectation that emerges with cross-time and cross-situational consistency (Yuan et al. [1]; Wen et al. [2]). Importantly, trait optimism was regarded as one of the most predictable traits with regard to an individual's physical and mental health as well as the achievement. Previous studies have established that optimists are more resilient than pessimists, are less likely to develop depression, experience lower levels of stress, depression, and loneliness, feel more social support, and adapt to a new life at a faster pace (Michael & Charles [3]). Furthermore, in comparison with the others, optimists are more likely to seek good health behaviors and social support, which could in turn prevent and reduce the occurrence of diseases (Seligman [4]).

Previous studies that linked trait optimism with various positive outcomes are largely based upon the so-called endogenous personality theory, for example, the arguably most influential five-factor theory (McCrae & Sutin [5]), have dominated the personality research for years. These

theories posit that personality traits are stable factors that hardly fluctuate across the life span and that have a unidirectional influence on people's important outcomes (e.g., financial situations, physical and mental health, etc.). However, a recent debate emerging from personality research seems to favor a more contemporary view of personality traits, which was summarized nicely in the dynamic personality theory (Roberts, Wood, & Caspi [6]). This perspective challenges the traditional endogenous theory by stressing the potential variations of personality traits and attributing such variations to daily or significant life events. Recent personality studies offered empirical support for the dynamic personality theory: indeed, Borghuis et al. [7] found that the trait neuroticism fluctuated considerably over even a short period of time and these variations can be partly explained by negative daily experience. Although trait optimism has been consistently established as one of the most important traits in determining one's career success as well as psychological well-being, unfortunately, whether and to what extent it fluctuates remains unknown. One of our major contributions in the current study is to address this important question with panel data collected over more than seven years. Furthermore, in the current study, we

investigate the potential antecedents of such variations. More specifically, based upon previous studies that established the link between life experiences and personality traits, we tested a bi-directional dynamic model that viewed the trait optimism and general life satisfaction as two interacting factors, thereby probing on the potential causal relationship between the two. Therefore, the current study not only contributed to a more thorough understanding of trait optimism, its variations, and the associated mechanisms but also empirically tested three competing theories with regard to the development of personality traits.

The article will be arranged as follows. In the first section, we reviewed theoretical and empirical studies on personality developments as well as the antecedents and consequences of trait optimism. After this, competing hypotheses, derived from different theoretical perspectives, were proposed and rationalized. In the second and third section, we presented the methods and the major findings of the current study. The paper concluded with a discussion in the fourth section.

### ***1.1. The definition of trait optimism and its positive effect on general life satisfaction***

According to the generation type of assumptions, we divided the existed work into two categories. The definition of trait optimism is based on the traditional expectation-value theory. Trait optimism refers to the expectation of positive results on the whole, while trait pessimism refers to the expectation of negative results on the whole. When positioning, people are seen as a column along a continuum, with optimists and pessimists occupying one of the ends (Yuan et al. [1]; Wen et al. [2]). One of the most consistent findings with regard to the positive outcomes brought about by trait optimism is the general life satisfaction, an overall evaluation of a person's quality of life according to the criteria he or she chooses (Sun et al. [8]). General life satisfaction has long been viewed as the indicator of mental health and relates to various important outcomes, such as longevity and physical well-being. Previous studies have found positive correlations between trait optimism and general life satisfaction across various samples in different cultures, such as China (Zhang et al. [9]), Turkey (Yalçın [10]), and the United States (Rew et al. [11]). In addition to this correlational evidence calculated from cross-sectional samples, longitudinal studies provided an even deeper insight into the temporal relationships and causality between the two variables. For example, Piper [12] has found that individuals' optimistic attitudes towards the future can significantly improve the analytical ability of the life satisfaction model. Following the same vein, in China, optimism has been found to predict general life satisfaction in a later time point among junior high school students (Xue, [13]), secondary vocational students (Peng [14]), and college students in China (Zhang et al. [9]).

Based on these studies, we proposed Hypothesis 1, which serves a replication of the previous findings.

**Hypothesis 1:** trait optimism affects general life satisfaction positively

Although the positive effect of trait optimism on general life satisfaction has been long established in both cross-sectional and longitudinal samples, the adverse relationship, namely whether and how general life satisfaction could affect has received little to no attention. To address this issue, however, we should first consider whether trait optimism is stable or fluctuate across a period of time (if the trait remains stable during the development, general life satisfaction, or any other factors, is impossible to exert any meaningful influences).

### ***1.2. The temporal variation of trait optimism***

The definition of trait optimism is based on the traditional expectation-value theory. Trait optimism refers to the expectation of positive results on the whole, while trait pessimism refers to the expectation of negative results on the whole. When positioning, people are seen as a column along a continuum, with optimists and pessimists occupying one of the ends (Yuan et al. [1]; Wen et al. [2]). The aforementioned two personality theories made contrasting hypotheses concerning the temporal variation of trait optimism. On the one hand, according to the endogenous personality theory, one could only observe little variation in trait optimism in the development. On the other hand, the dynamic personality theory posits that although trait optimism might be more stable than other psychological constructs such as attitudes and (or) values, it still enjoys considerable variation across time, shaped by both meaningful events (Endler & Parker [15]; Magnusson [16]) as well as daily experiences (Roberts & Jackson [17]; Wrzus & Roberts [18]).

Rooted from a genetic view on traits, the endogenous personality theory regards personality traits as a set of explicit behavioral tendencies that were mainly inherited and (or) developed through early adulthood. After entering adulthood, however, the endogenous personality theory argues against any meaningful fluctuation of personality traits and always treated these traits as time-invariant constructs.

In direct contrast to the underlying assumption of the endogenous personality theory, the dynamic personality theory assumes that personality trait changes unfold gradually through the accumulation of daily experiences and people's responses to these experiences (Baumert et al. [19]; Geukes et al. [20]). More specifically, the dynamic personality theory postulates that personality trait changes are driven by experiences that influence state levels (i.e., momentary thoughts, feelings, and behaviors) and/or state contingencies (i.e., how much different states depend on each other) (Buss & Craik [21]; Fleeson & Jolley [22]). This theory has achieved numerous empirical support in recent years, especially among high-validity longitudinal studies. Wagner et al. [23] found an interactive process between neuroticism and negative daily experiences while

Borghuis et al. [7] found that day-to-day bickering and stress can affect the trait neuroticism at a significant level. As the dynamic personality theory has received increasing attention and endorsement, when considering the longitudinal reciprocity between trait optimism and general life satisfaction, it seems natural to as well consider the effects.

### **1.3. The effects of general life satisfaction on trait optimism**

First, the endogenous personality theory offers a direct prediction with regard to the effects of and general life satisfaction on trait optimism, namely that the trait optimism is not affected by general life satisfaction, because of its lack of variation. Therefore, Hypothesis 2a is proposed as follows:

**Hypothesis 2a:** Changes in life satisfaction were not associated with subsequent changes in optimism.

The research of Yang & Urminsky [24] defines the concept of “situational future outlook, that is, thinking optimistically or pessimistically about an imminent outcome in the current status (therefore also called “local optimism/pessimism”). They argued that such local judgments are largely based on prior events. This is because people spontaneously form expectations for future results from local conditions (Bandura[25]; Scheier and Carver [26]). They define local optimism (vs. local pessimism) as positive (vs. negative) anticipatory states about imminent outcomes, which depends on the causal inference of available information, including past results and situational characteristics. According to this theory, when their prior efforts have been successful, people are often optimistic, inferring from the prior outcomes that future outcomes will also be successful (Gilovich, Vallone, and Tversky [27]), whereas past failures will often lead to pessimism about future outcomes. As general life satisfaction indicates one’s feelings at the current time, it is a good indicator of past success and failures. More specifically, a higher score of general life satisfaction indicates a more pleasant general feeling towards the past. These people may be optimistic about the future: their satisfaction with their current life might persuade them to believe in a similar outcome in the future – they will always be mostly satisfied. According to these analyses, we propose the hypothesis 2b

**Hypothesis 2b:** changes in life satisfaction will positively affect the individual's level of optimism afterward.

However, some psychologists argue that a positive past experience does not always lead to an optimistic outlook (Van Boven et al. [28]). In particular, the opposite inferences can be made for predominantly chance-based outcomes, with greater local optimism after prior failure and greater local pessimism after prior success (e.g., the gambler’s fallacy; Clotfelter and Cook [29]). These findings were also in line with the observations from the domain of behavioral economics. Specifically, researchers have found people have a general tendency to over-

estimate the likelihood of randomly generated content (Tversky and Kahneman [30]; Rabin and Vayanos [31]). This misperception of chances can lead to errors in predictions. In Daniel, Tobias & Kelly’s [32] analysis of decision making under uncertainty, a decision-maker who himself suffers from the gambler’s fallacy may similarly believe that streaks of good or bad quality cases are unlikely to occur by chance. Consequently, the decision-maker may consider the next outcome to be intentionally opposite to the current states.

When applied to the current study, the miscalculation will likely distort people’s optimism, namely, people with a higher level of life satisfaction will think that the good results obtained in the past not only due to their efforts but also came from pure luck. This will lead to overly pessimistic predictions, because, according to the gambler’s fallacy, one cannot always be lucky. They will worry that they will become unlucky later. According to these insights on behavioral economics and psychology, we derive hypothesis 2c.

**Hypothesis 2c:** Life satisfaction has a positive and direct effect on the individual's degree of optimism.

It is interesting to note that Hypotheses 2a-2c were competing for hypotheses that were derived from important psychological insights.

This thesis wants to explore whether life satisfaction changes optimism. Moreover, the RI-CLPM model is used to test better the causal relationship in a longitudinal data sample, especially the within-person effects. It will also test two theories about whether optimism can be changed. These results will have excellent reference significance for future clinical intervention.

## **2. METHOD**

### **2.1. Participants**

This study examined the reciprocal relationship between trait optimism and general life satisfaction in a representative sample of about 7,845 Dutch citizens (3,683 women, 3,123 men, and 3,123 unknown) for seven consecutive years. The age of the participants ranged from 17 to 96 years.

### **2.2. Measurement**

**Optimism** was measured by the Revised Life Orientation Test scale (or LOT-R) (Scheier & Bridges [33]). The LOT-R is a revised ten-item self-reported measure (of all ten items, four are filler items and are not used in scoring) assessing generalized expectancies for positive versus negative outcomes. Respondents were asked to indicate their degree of agreement concerning statements such as "In uncertain times, I usually expect the best," using a 5-point Likert scale. Of the six scored items, three are worded in a positive direction, and three are worded in a

negative direction. Negatively worded items are reverse coded before scoring. The scale demonstrated good psychometric property in the current study, with the Cronbach's alpha equaling .65, .65, .66, .68, .68 and .70 in 2012, 2013, 2014, 2015, 2017, 2018 respectively.

**Life satisfaction** was measured by the Satisfaction With Life Scale (SWLS) (Diener et al. [34]). SWLS is a five-item self-reported measure that regards life satisfaction as a cognitive-judgmental process. Respondents were asked to indicate their degree of agreement with statements such as "In most ways, my life is close to my ideal," and "The conditions of my life are excellent," using a 7-point Likert scale. This measurement also demonstrated good reliability in the current sample; Cronbach's alpha was 0.88 in 2012,2013 and 0.89 in 2014,2015,2017,2018. Furthermore, a set of control variables were included in the current analysis, such as gender, age, income, and education.

**2.3. Analytics Procedure**

In this study, a newly proposed statistical model – the random-intercept cross-lagged panel model (RI-CLPM; Hamaker et al. [35]) was used to test the hypotheses. This model is able to effectively differentiate the between-person covariance from the within-person effects that we are particularly interested in. Notably, the traditional approaches in longitudinal modeling are limited to support casual claims. In essence, the multilevel models could not capture the lagged effect (Zyphur et al. [36]), while the cross-lagged panel model (CLPM) undesirably mixes between-personal effects and within-person effects

(Hamaker et al. [35]). The RI-CLPM model addresses these drawbacks by incorporating the core strength of both multilevel models (i.e., to distinguish the between-person effects and the within-person effects) and CLPM models (i.e., to encompass the lagged effects).

This study paid particular attention to the cross-lagged effect of life satisfaction on optimism and vice versa, thereby to test the causal relationship between general life satisfaction and trait optimism. Furthermore, to account for the measurement errors, the RI-CLPM model was embedded in the SEM framework, in which the CFA-like measurement models were used to partial out the adverse effect brought by the imperfect measurements. All of the current analysis was carried out in the statistic software R with the lavaan package.

**3. RESULTS**

**3.1. The between-level correlation table**

Correlation between optimism, life satisfaction, and various demographic variables, as shown in Table 1. It can be seen that there was a significant positive correlation between general life satisfaction and the age (the male was on average happier than female), the level of education of the respondents. Furthermore, optimism was positively related to gender, age, and education was significantly positive. Last, at an aggregate level, a significant positive correlation was found between optimism and life satisfaction.

Table 1 Means, standard deviations of the variables and the correlations among the variables

Variable	M	SD	1	2	3	4	5	6
1. gender	0.46	0.5						
2. age	4.85	1.73	.07**					
			[.05, .09]					
3. n_child	0.83	1.13	-.04**	-.43**				
			[-.06, -.02]	[-.45, -.41]				
4. income	7.97	4.89	.11**	.22**	-.13**			
			[.09, .13]	[.19, .24]	[-.15, -.11]			
5. education	3.57	1.53	.08**	-.03**	-.03*	.10**		
			[.06, .10]	[-.05, -.01]	[-.05, -.01]	[.08, .12]		
6. gls	5.02	0.99	0	.05**	0.01	-0.02	.09**	
			[-.03, .02]	[.03, .07]	[-.01, .04]	[-.05, .00]	[.07, .11]	
7. opt	3.38	0.5	.02*	.06**	-0.01	0.01	.22**	.56**
			[.00, .05]	[.04, .08]	[-.03, .02]	[-.02, .03]	[.20, .25]	[.54, .57]

Note. Mand SD are used to represent mean and standard deviation, respectively.

\* indicates p < .05. \*\* indicates p < .01.

3.2. Test of the hypotheses

Following the general procedures of building up an SEM model, we first tested a model with only the measurement unit (i.e. the CFA model). With CFI equaling 0.79, and an RMSEA value of 0.059 (which is smaller than 0.08, an important criterion for determining the adequacy of model fit). Therefore, the adequate model fit adequate suggests a good construct validity.

In the next step, we further included the structural part of the model and empirically tested our hypotheses. Again, the model fit can be considered adequate (CFI = .79 and RMSEA = .06). The estimated model from RI-CLPM is illustrated in Figure 1, where  $G_i$  ( $i = 1, 2$ ) represents the general life satisfaction measured at the time  $i$ , while  $O_i$  ( $i = 1, 2$ ) dedicates the optimism tested at each time point. The arrow represents the lagged effects (from  $G_1$  to  $G_2$ , from  $O_1$  to  $O_2$ ) and the cross-lagged effects (from  $O_1$  to  $G_2$ , from  $G_1$  to  $O_2$ ). While the lagged effects reveal the temporal effect within a specific construct, the cross-lagged effects could potentially hint on the causality between variables and offer a formal test of the hypotheses. According to Figure 1, Hypothesis 1 is confirmed such that trait optimism measured at time point  $t-1$  positively and significantly affect general life satisfaction measured at time point  $t$  ( $b = 1.71$ ,  $se = .07$ ,  $p < .001$ ) Furthermore, concerning the series of competing Hypothesis 2a-2c, Figure 1 offered the strongest support to Hypothesis 2b, such that the general life satisfaction of time  $t-1$  was

negatively related to trait optimism of time  $t$  ( $b = -.04$ ,  $se = .005$ ,  $p < .001$ ).

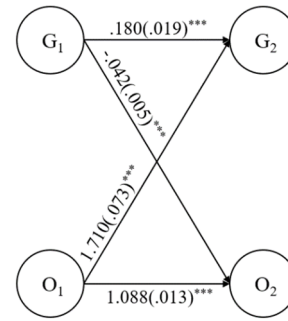


Figure 1 The estimated RI-CLPM model

Note: Figure 1 did not include the personal level predictors (whose effects were entered as a combination of fixed effects and random effects)

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Since it is desirable to build up a parsimonious model, we have additionally tested whether the paths are necessary to be included. The results are reported in Table 2. In comparison, the RI-CLPM model with the path that links general life satisfaction and optimism provides a better model fit, according to the value of AIC, BIC, as well as the Chi-square test.

Table 2 Chi-Square Difference Test

Model	Df	AIC	BIC	Chisq	diff	Df	diff	Pr(>Chisq)	
fit3a	1809	775133	776505	45875					
fit3b	1810	775222	776587	245967	91.373		1	< 2.2e-16	***

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

4. DISCUSSION

From our estimation of an advanced RI-CLPM model, we have found causal relationships between trait optimism and general life satisfaction such that trait optimism positively predicted general life satisfaction while general life satisfaction negatively predicted trait optimism. In other words, we have found compelling support for Hypothesis 1 and 2b.

In addition to the misjudgment of probability mentioned previously, another plausible explanation is provided by the sequential contrast effects (SCE), which suggests that the decision maker's perception of the quality of the current case is negatively affected by the quality of the previous cases (Pepitone and DiNubile [37]; Simonsohn [38]). For example, Bhargava and Fisman [39] found that speed dating partners are likely to reject the next candidate if the previous candidate is very attractive. Following

similar reasoning, people who enjoyed a higher degree of general life satisfaction at the previous time points might lead to an unfavorable perception of the events happening at later times, thereby formulating a general permissive perspective.

Our findings could possibly bring about a new theoretical contribution to the personality theory with regard to trait optimism. Our findings are more in line with the dynamic personality theory that stresses the variation of optimism across a significant period of time. Interestingly and importantly, such variation is negatively determined by different levels of general life satisfaction measured at a prior time. Although the general life satisfaction reflects positive aspects of personal experiences, one of its adverse effects is to push an individual to a more permissive domain. Also, we have successfully replicated previous findings that optimism could positively affect general life satisfaction via a more strict design and a more sound statistical analysis.

In our study, cultural context is an important factor. The data we used was from the 2012-2017 survey of Dutch people. This period coincides with the financial crisis, the European debt crisis, and so on. Political and economic factors may influence the subjects' optimism and life satisfaction. The specific characteristics of social, cultural, and economical backgrounds might influence the reciprocity between the two variables. Therefore, to establish the robustness of the current findings, it is pertinent to replicate the model under another context and with another sample. For example, with regard to the Chinese culture, people are more likely to believe that "wealth and misfortune are two barrels in the same well" and that they may be more inclined to remain more vigilant and less optimistic in the context of high life satisfaction. Therefore, we might expect an even more negative causal relationship between general life satisfaction and optimism.

Another avenue for future exploration is the motivational aspect of achievement. Some people with high life satisfaction attribute their success to a high level of luck (i.e. the extrinsic attribution), rather than a high level of personal efforts (i.e. the intrinsic attribution). While the first group of people might demonstrate the same pattern as found in the current analysis where general life satisfaction negatively affects optimism, the second group of people might exert an adverse pattern, namely, general life satisfaction positively affects optimism. It is therefore interesting to explore the subgroups of the population and their distinctive patterns.

## 5. Conclusion

This study examined the relationship between general life satisfaction and trait optimism for Dutch citizens over the past seven years. Using Random Intercept Cross Lagged Panel Model (RI-CLPM), the following conclusions are obtained: This study repeats the findings of previous studies, that is, trait optimism positively predicts people's life satisfaction. And this finding is more in line with the endogenous personality theory. At the same time, the study found that the effect of general life satisfaction on optimism is estimated to be negative. We believe that people will make wrong estimates of the probability of events, such as the gambler's fallacy, which can be used to explain this phenomenon. Finally, we propose that social and cultural background, achievement motivation, etc. may also have a certain impact on this relationship, which will be the direction of future research.

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