
Meaning in Life as Predicted by Basic Psychological Needs: A Study with Chinese Undergraduate Students

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Abstract: *Background:* Meaning in life is an essential construct in individuals' lives, related to individuals' overall well-being. Several factors can lead to meaning in life, among them is the satisfaction of basic psychological needs. According to the Self-Determination Theory, the tendency towards achieving meaning in life is innate in individuals' motivational tendency to understand their surroundings and be a part of it. Moreover, the satisfaction of basic psychological needs is essential for a healthy well-being, and thus can contribute to meaning in life. *Research purpose:* The research purpose was to measure the relationship between basic psychological needs and meaning in life levels (general, situational, daily) and dimensions (purpose, significance, coherence) among Chinese undergraduate students. *Methods:* Basic psychological needs as categorized by the Self-Determination Theory are autonomy, competence, relatedness, and beneficence were measured in this research. Meaning in life levels, general, situational, and daily, and dimensions, significance, purpose, and coherence were measured in this research. Three sub-studies were conducted with three different samples of Chinese undergraduate students. Age ranged between 17 and 26 years old, with a majority of females participants across the three sub-studies. Sub-study one included 173 participants and was a correlational study. It measured general basic psychological needs and meaning in life. Sub-study two included 367 participants and was also a correlational study. It measured situational basic psychological needs and meaning in life, as well, as meaning in life dimensions, significance, purpose, and coherence. Sub-study three included 61 participants and was a longitudinal study. It measured daily basic psychological needs and meaning in life across seven days. *Results:* The research found a relationship between basic psychological needs and meaning in life at the general, situational, daily levels and meaning in life dimensions. Autonomy predicted meaning in life dimensions (significance, purpose, coherence), competence predicted daily and coherence dimension of meaning in life. Additionally, relatedness predicted significance and coherence dimensions of meaning in life, and beneficence predicted daily and purpose dimension of meaning in life. *Conclusions:* The research found a relationship between basic psychological needs and meaning in life. The research also confirmed the universality of basic psychological needs. There was a difference in basic psychological needs prediction role across meaning in life levels and dimensions. The research presented similar and different results from previous research, which the door to further research on the role of mediators in the BPN – MIL relationship.

Keywords: Meaning in Life, Meaning Dimensions, Self-Determination Theory, Basic Psychological Needs, Undergraduate Students

1. Introduction

1.1. Meaning in Life

According to Frankl [1], meaning in life (MIL) is a goal against individuals' existential frustration. It is an essential

construct in individuals' lives, related to individuals' overall well-being. The formation of MIL is related to social, cultural, and personal situations and circumstances. MIL is being able to define the world around us and define oneself as an active individual in society [1, 2]. Additionally, presence of MIL is when an individual clearly defines the surroundings and self [2].

Furthermore, theories rendered achieving MIL into achieving its dimensions. There are several categorizations of MIL dimensions. According to Steger, achieving meaning can be through finding a greater purpose or goal in life (Purpose), feeling of self-worth (Significance), and understanding the world or life (Coherence) [3, 4]. Purpose, significance, and coherence are independent constructs under the umbrella of MIL [4].

1.2. Meaning in Life Predictors

Several psychological constructs were measured as predictors of MIL. For instance, previous research concluded that positive affect partially mediated the relationship between loneliness and MIL [5], social relatedness and MIL [6], and MIL and future-oriented coping [7]. Additionally, positive affect predicted MIL across a short time frame of days and a long-time frame of years [8]. On the contrary, loneliness moderated the interaction between positive affect and MIL [6]. Loneliness and MIL also had the opposite relationship; MIL predicted loneliness, where coherence was the strongest predictor as a MIL dimension [9]. Finally, sense of belonging positively predicted MIL in cross-sectional, longitudinal, and experimental designs [10].

1.3. Satisfaction of Basic Psychological Needs and Meaning in Life

According to the Self-Determination Theory (SDT) the satisfaction of basic psychological needs (BPN) is essential for a healthy well-being. The SDT also argued that the tendency toward achieving MIL is innate in individuals' motivational tendency to understand their surroundings and be a part of it. Theoretically, the SDT claims that since basic psychological needs (BPN) predict well-being, they must also predict MIL; since MIL is a part of well-being [11, 12].

The four BPN highlighted by the STD are autonomy being able to freely act and decide, competence being capable of doing and able to improve one's capabilities, relatedness being able to connect to other individuals in the society [11, 13], and lately, beneficence being able to contribute to the society [14]. The satisfaction of BPN is universal and subjected to social and environmental conditions.

Empirically, Martela and colleagues [15] argued that BPN predicted MIL. The study measured the BPN-MIL relationship at three levels, general, situational, and daily. The study showed that autonomy, competence, relatedness, and beneficence predicted general, situational, and daily MIL. The satisfaction of one or all of the BPN on a daily, situational, or general level led to the presence of MIL. Also, a recent study across 27 European countries revealed the association between BPN and higher levels of MIL [16]. Eakman [17] also found that autonomy, competence, and relatedness mediated the relationship between participating in meaningful activities and MIL.

1.4. Satisfaction of Basic Psychological Needs and the Meaning of Life of Chinese Students

According to the SDT, collectivist cultures tend to satisfy relatedness and autonomy by being part of society and

responding to group norms [11, 12]. For example, previous research found that Asian college students reported less competence and relatedness satisfaction than non-Asian college students [18]. Additionally, adolescents from Western and Eastern cultures did not vary in autonomy satisfaction support but varied in competence satisfaction support. Adolescents in Western cultures had higher competence satisfaction support [19]. Chen and colleagues [20] found that Chinese adolescents satisfy autonomy by valuing and following their parents' advice. Similarly, a meta-analysis by Yu and colleagues [21] resulted that the satisfaction of autonomy correlated with subjective well-being with no difference between the USA and East Asian populations.

Moreover, Chen and colleagues [20] resulted in that competence frustration levels are higher in Chinese school students compared to other cultures.

Finally, concerning the relationship between BPN and MIL. One previous study measured the relationship between MIL and BPN in the Chinese context. In a four-wave longitudinal data Zhang and colleagues [22] found that autonomy, competence, relatedness, and future MIL had a bidirectional predicting relationship in a sample of Chinese university students.

1.5. The Present Research

The present research's objective was to measure the relationship between BPN and MIL. General, situational, and daily MIL were measured in studies 1, 2, and 3, respectively. MIL dimensions, which are purpose, significance, and coherence [3, 4] were measured in study 2.

Furthermore, according to the SDT, the satisfaction of BPN is bound to environmental conditions [11, 12]. Previous research in the Chinese context found a low satisfaction of competence and high satisfaction of autonomy among Chinese adolescents and college students [18, 19]. Hence, it was expected to (1) find a relationship between BPN and MIL levels and dimensions and (2) there will be a difference in BPN prediction role at MIL levels and dimensions.

1.6. Ethical Consideration

This study was approved by the ethical committee in School of Psychology in Northeast Normal University (reference number: 2021021) and was under the guidelines of the Helsinki declaration in 1964. Participants signed an informed consent prior to data collection.

2. Study 1 General MIL and General BPN

2.1. Method

2.1.1. Participants

According to G*Power, for a model with four predictors, an effect size of .015, a power of 0.95, and an alpha of .05, a total of 129 participants is needed. Participants were 173, 108 (62.4%) females and 65 (37.6%) males. They were

undergraduate students from universities in Northeast China, age ranging between 18 and 26 years old ($M=20.16$, $SD=1.53$).

2.1.2. Procedure

The data collection procedure was through an online questionnaire using on-campus advertisement and for exchange of a gift. Data were collected in the Chinese language and from undergraduate students.

2.1.3. Measures

Meaning in life. MIL was measured through the Presence of Meaning subscale of the Meaning in Life Questionnaire (POM-MIL) [2]. The scale contains five items on a 7-point Likert scale, ranging from 1 (absolutely untrue) to 7 (absolutely true). Translation of the items into the Chinese language was done in two steps; step one is translation from the English language to the Chinese language by a bilingual post-graduate student. Step two is cross-checking the items by a professional on the topic. Amos Graphics was used to perform a confirmatory factor analysis. Results showed a very good fit, Chi-square (χ^2) = 2.825, degree of freedom (df) = 3, $p=.419$, goodness of fit index (GFI) = .994, comparative fit index (CFI) = 1, root mean square error of approximation (RMSEA) = .000 (.000-.126), and standardized root mean square residual (SRMR) = .0195 [23]. The reliability of the scale was measured through Cronbach's alpha, $\alpha=.771$.

Basic Psychological Needs. The three BPN, autonomy, competence, and relatedness, were measured using the need satisfaction items of the Basic Needs Satisfaction and Frustration Scale. There are 12 items in total, with four items measuring the satisfaction of each need on a 5-point Likert scale ranging from 1 (not true at all) to 5 (completely true) (Chen et al., 2015). The Chinese version of this scale was adopted from Van der Kaap-Deeder and colleagues [24]. Cronbach's alpha was used to measure the reliability, autonomy ($\alpha=.850$), competence ($\alpha=.875$), and relatedness ($\alpha=.835$). Beneficence was measured using 4-items developed by Martela and Ryan [14] on a 5-point Likert scale ranging from 1 (not true at all) to 5 (completely true). Translation of beneficence items into the Chinese language was done using the same procedure for translating POM-MIL. A four-factor model including autonomy, competence, relatedness, and beneficence, was tested using Amos Graphics. The model was acceptable, RMSEA was higher, and GFI was lower than the acceptable range of 0.8 and 0.9, respectively ($\chi^2=226.970$, $df=92$, $p=.001$, $GFI=.859$, $CFI=.931$, $RMSEA=.092$ (.077,.108), $SRMR=.0436$) [23]. The reliability of beneficence was measured through Cronbach's alpha $\alpha=.771$.

2.2. Results

Means and standard deviations of MIL and BPN are presented in Table 1. As presented in table 1, MIL positively correlated with the four BPN.

The path results showed that of the four BPN, autonomy ($\beta=.536$, $S.E.=.155$, $p=.001$) and beneficence ($\beta=.467$, $S.E.=.178$, $p=.009$) showed to be significant predictors of

general MIL with $R^2=.441$.

Table 1. Means, SDs, and correlations of MIL and BPN (Study 1).

Variable	M	SD	1	2	3	4	5
1: MIL	5.07	1.19	-				
2: AUT	3.87	.84	.63**	-			
3: COM	3.94	.76	.58**	.83**	-		
4: REL	4.06	.76	.53**	.71**	.72**	-	
5: BEN	3.89	.76	.62**	.78**	.81**	.78**	-

** $p<.01$

Note. AUT = autonomy, COM = competence, REL = relatedness, BEN = beneficence.

2.3. Discussion

Similar to previous research, the four BPN positively correlated with general MIL [15, 16, 17]. In a Chinese sample of undergraduate students, autonomy and beneficence directly contributed to the formation of general MIL by around 44%. However, competence and relatedness did not show to have a direct contribution. Somehow similar to Zhang and colleagues [22] results in that autonomy, competence, and relatedness contributed to MIL in a longitudinal study. Similarly, these results partially aligned with Martela et al. [15] research that found a direct relationship between all four BPN and general MIL.

3. Study 2 Situational MIL and Situational BPN

3.1. Method

3.1.1. Participants

Similar to study 1, G*power was used to calculate the needed number of participants. Participants were 367, 287 (78.2%) females and 80 (21.8%) males undergraduate students from universities in Northeast China. Age ranging between 18 and 22 years old ($M=19.43$, $SD=.79$).

3.1.2. Procedure

Data collection procedure was similar to study 1. To measure MIL and BPN at a specific moment, participants were asked to recall "the single most personally meaningful event in the past two weeks" and answer the preceding questions per that event. To ensure that participants will answer every item per the meaningful event, every item of the MIL and BPN scales was preceded with "During this event...".

3.1.3. Measures

Meaning in Life. Four different scales measured MIL. First, situational meaning in life was measured using the same scale as in study 1. Reliability was good $\alpha=.749$. Meaning as significance was measured through the four-item sub-scale of Meaningful Life Measure [25] on a 7-point Likert scale ranging from 1 (absolutely untrue) to 7 (absolutely true) ($\alpha=.908$). Third, meaning as purpose was measured through a three-item scale [15] on a 7-point Likert scale ranging from 1

(absolutely untrue) to 7 (absolutely true) ($\alpha = .941$). Fourth, meaning as coherence was measured through the five-item subscale of the Multidimensional Existential Meaning Scale (George & Park, 2017) on a 7-point Likert scale ranging from 1 (absolutely untrue) to 7 (absolutely true) ($\alpha = .930$). The translation procedure of the scales into the Chinese language was similar to study 1. Similarly, a three-factor (significance, purpose, coherence) model fit was measured using confirmatory factor analysis [3, 4]. The model showed a good fit with $\chi^2 = 152.800$, $df = 47$, $p = .001$, $GFI = .935$, $CFI = .977$, $RMSEA = .078$ (.065, .092), $SRMR = .0286$.

Basic psychological needs were measured with the same scale as study 1. Cronbach's alpha showed very good reliability; autonomy ($\alpha = .872$), competence ($\alpha = .886$), relatedness ($\alpha = .868$), and beneficence ($\alpha = .886$).

3.2. Results

Participants reported 26 personally meaningful events. However, 25 (6.8%) participants reported not experiencing any meaningful event in the past two weeks (Table 2).

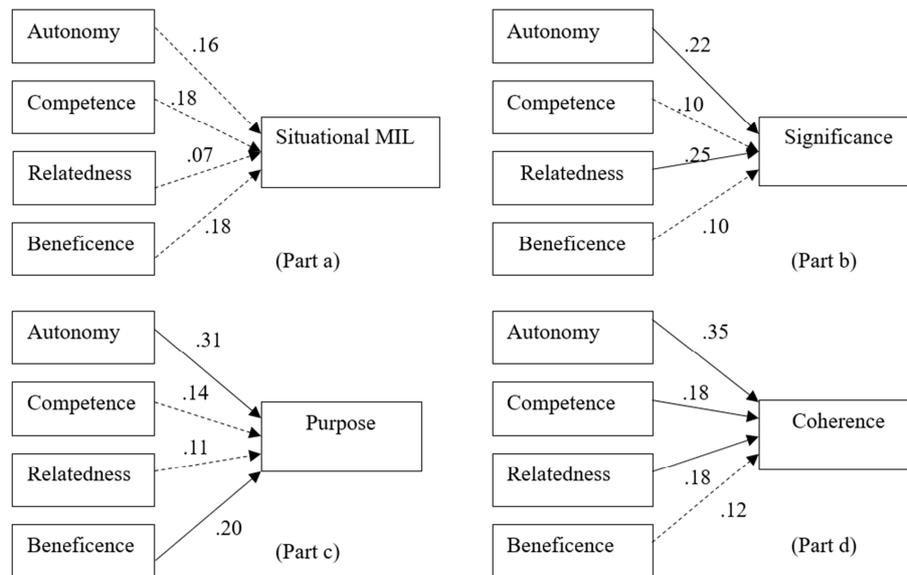
Means and standard deviations of situational MIL, significance, purpose, coherence, and the BPN are presented

in Table 3. Situational MIL, significance, purpose, coherence, autonomy, competence, relatedness, and beneficence are all positively correlated.

Table 2. 10 most frequent meaningful events (Study 2).

	<i>frequency</i>	<i>percentage</i>
Achieved a new task	76	20.7
Played sports regularly	46	12.5
Learning something new	38	10.3
Did not experience any	25	6.8
Being with friends	24	6.5
It snowed this week	20	5.4
Studying	19	5.17
Volunteering/blood donation	17	4.6
Passed an exam	11	2.9
Won a scholarship	10	2.7

The path analysis showed that none of the four BPN showed to be a predictor of situational MIL. Autonomy and relatedness predicted significance ($R^2 = .392$), autonomy and beneficence predicted purpose ($R^2 = .496$), and autonomy, competence, and relatedness predicted coherence ($R^2 = .623$). The path models are presented in Figure 1.



Note. Solid path coefficients are statistically significant, $p < .05$. Dotted path coefficients are not statistically significant.

Figure 1. Path analysis models.

3.3. Discussion

Participants reported 26 different personally meaningful events; interestingly, the ten most reported meaningful events mostly focused on satisfaction of competence. For example, achieving a new task or learning a new technique are mainly focused on competence. However, even though Chinese undergraduates reported the most significant situational MIL as mostly related to competence, the results did not show any statistical significance of an effect of competence on situational MIL. Thus, another factor might mediate the relationship between situational BPN and situational MIL.

Otherwise, another measurement tool should be used to explain the results. A qualitative measurement could explain why students focus on situational MIL related to competence, but it did not show any statistical significance.

Furthermore, BPN were associated with situational meaning, significance, purpose, and coherence. The highest association of BPN was with coherence. The prediction models also reflected that BPN contributed more to the variance in coherence (62.3%) compared to the other meaning dimensions or situational MIL. Thus, participants mostly correlated understanding life around them with the satisfaction of BPN. These results also confirmed the hypotheses and partially aligned with previous results.

Martela et al. [15] found an association between the four BPN and MIL; however, they did not eliminate the possibility of an effect of other factors.

4. Study 3 Daily Meaning and Daily BPN

4.1. Method

4.1.1. Participants

G*power estimated for a power of .95, effect size of .15,

and alpha of .05, 89 participants are needed. Initially, 70 Chinese undergraduate participants joined the study, six participants dropped out of the study after two or three days, and three were dropped because they missed more than half of the days. Since no other undergraduates showed interest in joining this study, data collection was terminated. The final number of participants was 61, 54 (90%) were females and 6 (10%) were males, the age ranged between 17 and 22 years old (M=19.48, SD=1.255).

Table 3. Means, SDs, and correlations of situational MIL and BPN (Study 2).

Variable	M	SD	1	2	3	4	5	6	7	8
1: MIL	5.027	1.148	-							
2: Significance	5.921	1.265	.667**	-						
3: Purpose	5.648	1.362	.664**	.751**	-					
4: Coherence	5.703	1.182	.660**	.781**	.860**	-				
5: Autonomy	4.023	.748	.525**	.595**	.679**	.763**	-			
6: Competence	4.00	.752	.525**	.571**	.652**	.734**	.859**	-		
7: Relatedness	4.111	.726	.502**	.595**	.640**	.726**	.833**	.810**	-	
8: Beneficence	4.012	.758	.523**	.573**	.657**	.721**	.834**	.831**	.840**	-

**p < .01

4.1.2. Procedure

Participants were recruited through on-campus advertisements. All data were collected through an online link open for access for three hours daily, from 5 pm to 8 pm. Prior to data collection initiation, the study procedure was explained. Participants were told that they would receive a daily link at 5 pm, and they were encouraged to fill in the questionnaire between 5 and 8 pm, after which access to the link would be suspended. Participants were also asked to fill in each day as if it was a new day and not worry if they missed a day. Moreover, to ensure participants' information was anonymous, participants were asked to generate a code at T1 and use it throughout the whole period of data collection. On day 1 (T1), participants received the pre-study questionnaire at 5 pm, which contained measures for MIL, BPN, and demographic information. Then, participants received the daily questionnaire that measured daily meaning and daily BPN for the following seven days. On day 9 (T2), participants received the post-study questionnaire.

4.1.3. Measures

Control variables. Trait MIL and trait BPN were measured at the pre-test to be used in the analysis as control variables. The scales measuring trait MIL and BPN were the same as in study 1. Cronbach's alpha was low for MIL ($\alpha = .448$), and good for BPN (autonomy, $\alpha = .763$, competence, $\alpha = .822$, relatedness, $\alpha = .836$, beneficence, $\alpha = .808$).

Daily measure. The daily measure was completed by participants daily for seven days. All items were reworded to be preceded by "Today..." to assure that participants reply on a daily experience and feeling.

Daily meaning in life. Daily MIL was measured using three items from two different scales and by measuring the general sense of meaningfulness. One item from Meaningful Life Measure was used [24], "Today, I felt that life is truly worth

living." And two items from King and Hicks [27], "This day was very meaningful to me." and "Today, I felt that my life had a clear sense of purpose." were used. It showed very good reliability, $\alpha = .883$.

Daily basic psychological needs. Autonomy, competence, relatedness, and beneficence were measured using the same scale as in study 1. Three items measuring each of the BPN were used. Reliability showed to be very good, autonomy $\alpha = .867$, competence $\alpha = .849$, relatedness $\alpha = .940$, and beneficence $\alpha = .887$.

4.2. Results

4.2.1. Preliminary Analysis

Before running the primary analysis, a correlation test was run to measure the relationship between daily measures. Daily measures were aggregated so that each participant had one score for each measure, then a between-person correlation of the daily measures was performed, as presented in Table 4.

Table 4. Means and SDs for trait variables (Study 3).

Pre-test (n = 61)		
Variables	M	SD
General MIL	4.957	1.134
Autonomy	3.569	.685
Competence	3.688	.679
Relatedness	3.975	.643
Beneficence	3.840	.600

4.2.2. Plan of Analysis

Two-level multilevel models were used to analyze the data at a daily level and with multiple times within one-person [28]. Data at the daily-level (level 1) were nested within data at the person-level (level 2). Day-level data were centered around the individual's mean, and person-level data were centered around sample means.

4.2.3. The Effect of Daily Basic Needs on the Daily Experience of Meaningfulness

The first-order model showed that 59.1% of variance in daily MIL was at the within person-level, and 40.9% of variance in daily MIL was at the between person-level. The second-order model showed that daily competence and daily beneficence were predictors of daily MIL. However, daily autonomy and daily relatedness did not show to be predictors. Results did not change in the third-order model; when introducing control variables. The results of the models are presented in Table 5.

Table 5. Multi-level models, including control variables (Study 3).

Meaningfulness			
Variable	β	CI	p
Daily autonomy	.087	[-.078,.253]	.300
Daily competence	.614	[.455,.774]	.001
Daily relatedness	.012	[-.187,.209]	.908
Daily beneficence	.217	[.024,.409]	.027
Weekend	.099	[-.044,.243]	.175
Trait-autonomy	.002	[-.156,.160]	.982
Trait-competence	.006	[-.128,.140]	.929
Trait-relatedness	.007	[-.155,.168]	.934
Trait-beneficence	-.014	[-.235,.207]	.902
Trait-meaning	.004	[-.128,.137]	.951

Note. Significance is highlighted in bold.

4.3. Discussion

Study three showed some significance in the relationship between BPN and MIL. Two of the daily BPN (competence and beneficence) predicted daily MIL. Previous research highlighted the frustration of competence. However, it might be that in the university settings of daily learning and daily assignments, competence is needed, and thus its satisfaction is what is leading to MIL. Although general and daily measures of competence differ, it seems that in the setting of Chinese university students, the need of acquiring a task and being competent in it is satisfied. Hence, this is reflected in MIL.

Moreover, beneficence showed to be an important predictor of MIL in Chinese university students. It had a role in situational and daily MIL. In other words, it was associated with specific events in students’ university lives.

The results confirmed the two hypotheses and partially aligned with previous results. All of the BPN were predictors of daily MIL in Martela and colleagues’ study [15].

5. General Discussion

This study generated two hypotheses. Through studies one, two, and three, the two hypotheses were accepted. BPN and MIL levels and dimensions were associated, and there was a difference in BPN prediction role at MIL levels and dimensions

Moreover, this study added three elements to the understanding of the relationship between BPN and MIL. The first element is how are MIL and BPN associated in Chinese undergraduate students, or is the prediction of MIL by BPN universal? The second is the role of coherence as a MIL

dimension in the relationship between MIL and BPN. Moreover, the third is adding to the literature measuring beneficence as part of the BPN proposed by the SDT [11, 14].

5.1. The Universality of Basic Psychological Needs

A partial prediction relationship between BPN and MIL was present. One relationship failed to exist between situational BPN and situational MIL. Converse to Zhang and colleagues’ [22] results, this study did not find all four BPN as predictors of MIL. Nevertheless, this study is in a different context than Zhang and colleagues’ study [22]; this study was collected after at least a year of the first outbreak of COVID-19. Moreover, previous research has shown a relationship between BPN and MIL in different societies or countries [15, 17-20, 22]. Mainly, Martela et al. study [15] found a direct relationship between autonomy, competence, relatedness, and beneficence and MIL three levels and three dimensions.

Across the three studies, autonomy had the strongest role in predicting MIL. The satisfaction of autonomy might lead to general MIL and situational purpose, significance, and coherence. Satisfaction of autonomy did not seem to have a role in daily MIL, this might be due to the fact that autonomy satisfaction is harder to be observed on a daily bases, while it can be observed in specific meaningful events and general MIL. Previous research in the Chinese context found that autonomy satisfaction in college and school students was similar to that in Western societies [19]. Besides that, it comes along with valuing family [20]. In the same context, competence played a role in situational coherence and daily MIL. It might be that daily competence satisfaction can be observed in a university setting since undergraduates show their academic competence daily.

On the other hand, beneficence and relatedness had other patterns of relationship with MIL. Beneficence predicted MIL at the general, situational purpose, and daily levels. Being able to give back to society is a characteristic of the Chinese collectivist society, allowing meaning formation through social connectedness. Additionally, relatedness only predicted situational significance and coherence. Thus, in Chinese undergraduate students, relatedness was connected to a specific event rather than to daily life or the general understanding of life.

From the point of view of the SDT, BPN satisfaction is universal. However, environmental conditions can induce the satisfaction of one of the BPN to a greater level compared to the other BPN [11-13]. In this study, the satisfaction of BPN was important for MIL. As SDT argues, environmental conditions highlighted one BPN rather than the other [13]. Thus, in a sample of Chinese undergraduate students, BPN was universal. Additionally, each BPN had a unique relationship with a level or dimension of MIL. Autonomy is vital for forming general MIL, whereas competence and beneficence are important in forming daily MIL. Likewise, situational MIL is not affected by BPN; instead, MIL dimensions seem to be affected. Hence, Chinese undergraduates form their situational MIL by forming MIL

dimensions rather than MIL itself. Hence, the difference between Chinese and USA undergraduates is that for the latter the satisfaction of the four BPN is needed at all levels of MIL (general, situational, daily) [15].

5.2. MIL Definition

The results can be further interpreted in relationship with MIL definition and its difference across cultures and individuals. MIL is a construct that forms due to environmental conditions and social interactions. The definition of MIL that individuals form varies and contains subjectivity in it [1, 2, 3, 4]. In study two, participants recorded the "most meaningful event" they experienced. The focus of Chinese undergraduates was on obtaining something new (task or knowledge). These results might be related to the difference in university students between China and the USA (from previous research); or to the definition of a personal meaningful event between different cultures. Hooker and colleagues [29] found that according to USA undergraduates, the most daily meaningful events were related to the interaction with others, such as "spending time with loved ones" and "supporting a family member or a friend". On the other hand, for Chinese undergraduates, the most meaningful events were related to satisfying competence. Additionally, 25 Chinese undergraduates reported not experiencing any meaningful event. It seems that Chinese undergraduates attributed "a meaningful event" to a positive outcome and a positive experience rather than a positive or negative experience.

Moreover, another definition of MIL can be concluded from results of MIL dimensions. Previous research found purpose [30] or significance as highest contributors to MIL [4]. In this study coherence had the highest contribution to MIL. The satisfaction of BPN in Chinese undergraduates leads to the formation of coherence, which in turn forms MIL.

5.3. Other Contributing Factors

Moreover, the results heightened the possibility of other factors contributing to the BPN-MIL relationship. Further studies can focus on possible mediators between MIL and BPN. Noting that there exist numerous factors that contribute to the satisfaction of BPN and the formation of MIL. For instance, previous research measured the mediation role of positive affect [5], social relatedness, and loneliness [6]. Further studies should focus on measuring the mediation effect of some of these factors in the BPN-MIL relationship.

5.4. Limitations and Further Research

This study focused on some but not all limitations presented by Martela et al. [15] and holds few limitations. The study three parts had the same sample description of undergraduate students; approaching a broader sample would widen our understanding of MIL and BPN. Moreover, study three had a small sample size; a larger sample would have given a more comprehensive idea of the relationship between MIL and BPN. In fact, results from

study three should be interpreted with caution, since the sample size was lower than the statistically acceptable one. Additionally, reporting a meaningful event in study two reflected a deeper understanding of the results; while the scales used are all self-reported, expressing MIL in a narrative method could further explain the relationship between each of the BPN and MIL levels and dimensions. Besides, these results reflected the possibility of other psychological and social factors' involvement in the BPN-MIL relationship, a follow-up study addressing some of these factors would enhance (and confirm) previous research. Another follow-up study that manipulates the BPN would improve our understanding of the BPN-MIL relationship. Measuring whether a change in any BPN satisfaction level would affect the MIL levels would explain and confirm the association between high levels of BPN and MIL presented in studies one and two. Finally, the four-model fit of autonomy, competence, relatedness, and beneficence was acceptable, which opens the question of whether beneficence is a suitable candidate as a BPN. A further measurement or replication of the study might answer this question.

5.5. Conclusions

This research contributed to the understanding of the BPN-MIL relationship with a sample of Chinese undergraduate students. The research showed that there was an association between BPN and MIL. Additionally, there was a difference in BPN prediction role across MIL levels and dimensions. Autonomy predicted MIL at the general level and situational significance, purpose, and coherence dimensions. In a similar manner, beneficence predicted MIL at the general, situational purpose, and daily levels. Relatedness on the other hand, seemed to only be related to MIL at the situational level. Similarly, competence was a predictor of MIL at the situational coherence and daily level. The research presented similar and different results from previous research, which opened the door to further research on the role of mediators in the BPN – MIL relationship.

Conflicts of Interest

The authors declare no conflicts of interest.

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