

# Understanding the Rise of Unique Names: The Emphasis on Uniqueness Matters

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## Abstract

Uncommon personal names have become increasingly popular in many countries and cultures over the past decades. However, little is known about the causes. We propose that the emphasis on uniqueness, manifested both as a cultural value at the macro level and as an individual need at the micro level, may account for the widely observed increase in unique-naming practices. We tested these hypotheses in China. Study 1 found that the increasing cultural emphasis on uniqueness (rather than on independence or competition), as a Granger cause, explained the increasing name uniqueness. Study 2 revealed that the increasing individual need for uniqueness (rather than narcissism or self-esteem) explained the higher preference for unique baby names among younger than older generations. Study 3 showed that, in actual naming practices, younger parents emphasized name uniqueness (rather than modernity, positivity, or other features) more than older cohorts. These findings convergently support our hypotheses, highlighting the importance of identifying specific mechanisms underlying psychological and behavioral changes, rather than assuming the rising individualism as a general explanation.

**Keywords** cultural change, individualism, uniqueness, name, China

## 1 Introduction

Over the past decades, both individualistic and collectivistic cultures have witnessed an increasing tendency to give children unique/unusual names (i.e., unique naming), as observed in the United States (Grossmann & Varnum, 2015; Twenge et al., 2010, 2016), the United Kingdom (Bush et al., 2018), France (Mignot, 2022), Germany (Gerhards & Hackenbroch, 2000), Japan (Ogihara, 2021; Ogihara et al., 2015), and China (Bao et al., 2021; Cai et al., 2018; Su et al., 2016). Although the rising individualism has been suggested as a main cause (e.g., Twenge et al., 2010, 2016), the specific mechanisms have yet to be clarified. In this research, we propose that the rising emphasis on uniqueness, manifested both as the *cultural value of uniqueness* at the macro/societal level and the *individual need for uniqueness* at the micro/individual level, may have been responsible for this change.

### 1.1 Name and Naming Behavior

Name is not only a symbolic manifestation of a person, but also a sociocultural product carrying rich implications. As an individual characteristic, name manifests potential influences on human psychology and behavior, including self-evaluation (Jones et al., 2002), social perception (Sidhu et al., 2019), interpersonal relationships (Gebauer et al., 2012), facial appearance (Zwebner et al., 2017), and life decisions (Pelham et al., 2002) (for a review, see Bao & Cai, 2021).

As a sociocultural phenomenon, name and naming behavior have attracted the interest of linguists, sociologists, anthropologists, and psychologists. Some studies illustrated that variations in names may arise from diverse social factors, such as social class and race (Lieberson & Bell, 1992), name fashions (Berger

et al., 2012), and sociopolitical events in a historical period (Bush et al., 2018; Obukhova et al., 2014). Meanwhile, some other studies suggested the potential impacts of culture on naming behavior, such as the frontier culture (Varnum & Kitayama, 2011) and the culture of honor (Brown et al., 2014).

Studies relevant to our present research involve cross-temporal changes in names and naming practices, most of which have focused on the trends of name uniqueness. A landmark study by Twenge and colleagues (2010) found that from 1880 to 2007, more and more U.S. babies were given uncommon names. After that, similar findings have been replicated in the U.S. from 1880 to 2015 (Grossmann & Varnum, 2015; Twenge et al., 2016), in the U.K. from 1838 to 2016 (Bush et al., 2018), in France from 1800 to 2019 (Mignot, 2022), in Germany from 1894 to 1994 (Gerhards & Hackenbroch, 2000), in Japan from 2004 to 2018 (Ogihara, 2021; Ogihara et al., 2015), and in China from 1950 to 2009 (Bao et al., 2021; Cai et al., 2018; Su et al., 2016). Overall, these findings have demonstrated a global increase in the cultural practice of giving babies unique names.

### 1.2 Why Have Unique-Naming Practices Increased?

Previous studies have suggested the rising individualism as the main cause. In Twenge et al.'s (2010) study, they assumed that it was the growing "cultural importance placed on individualism" that led to the rise in unique naming in the U.S. (Twenge et al., 2010). Subsequently, many other studies utilized unique naming as a behavioral indicator of individualism when investigating cultural changes over time (e.g., Bazzi et al., 2020; Bianchi, 2016; Grossmann & Varnum, 2015; Mignot, 2022; Ogihara, 2021; Ogihara et al., 2015; for reviews, see Cai et al., 2019; Ogihara, 2017; Varnum & Grossmann, 2017).

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Assuming the rising individualism as the primary explanation for the increasing prevalence of uncommon names makes sense in several ways. Indeed, being unique is a core value of individualism (Markus & Kitayama, 1991; Oyserman et al., 2002) and, accordingly, people in individualistic cultures are more likely to make unique choices (Burns & Brady, 1992; Kim & Markus, 1999). Specifically, evidence has shown a positive correlation between regional individualism and regional prevalence of uncommon names (Varnum & Kitayama, 2011) and a coincidence between the rising individualism and the prevalence of unique names (Grossmann & Varnum, 2015).

However, there are also good reasons to challenge individualism as a general cause for the rise in name uniqueness. First, the observed cultural-level covariation might be spurious due to confounding variables and might not apply to the individual level (Na et al., 2010). More importantly, individualism is a cultural phenomenon involving diverse cultural values, beliefs, and practices (e.g., being unique, being independent, and being competitive). These facets may not always covary with each other or naming behavior (Ogihara et al., 2015; Oyserman et al., 2002). Probably, cultural emphasis on uniqueness is the only factor that could predict unique-naming behavior because they are conceptually similar. Therefore, rigorous empirical evidence is needed to identify which specific cultural value(s) can explain the increase in unique names.

### 1.3 The Present Research

In this research, we argue that not all facets of individualistic cultural values could explain the increase in unique-naming practices; instead, it was the increasing emphasis on uniqueness, manifested at both the macro/societal and micro/individual levels, that could explain the increasing prevalence of unique names due to conceptual similarity and relevance. Specifically, we hypothesized that the rising emphasis on the cultural value of uniqueness (at the macro level) and the individual need for uniqueness (at the micro level) would explain the rises in the macro-level prevalence of unique names (*H1*) and the micro-level preference for unique names (*H2*), respectively. Consequently, we hypothesized that an increasing demand for uniqueness of baby names would be observed in real naming practices (*H3*).

In testing the three main hypotheses, we also tested potential competing hypotheses for each of them. Doing this enabled us to directly show that not all facets of individualistic cultural values can account for the increase in unique-naming practices, and that the explanatory power of emphasis on uniqueness was not spurious due to its overlap with other values or constructs. To do this, we chose competing constructs that are distinct from but also related to uniqueness. If these constructs could not predict unique-naming practices, other totally distinct constructs would be more unlikely to be predictive.

Based on this logic, in testing *H1*, we also examined two other individualistic cultural values: being independent and being competitive. Both of them are distinct from being unique but are also related to uniqueness to some extent. For instance, being unique implies having a distinctive personal identity and standing out, which might be beneficial to independence and competitiveness (Lynn & Snyder, 2002); but neither of them could conceptually imply the behavioral outcome of giving more unique names to children. We expected that shifts in cultural values of independence and competitiveness would not be able to predict shifts in unique-naming practices due to their

conceptual distinction from uniqueness.

In testing *H2*, we also investigated the roles of two other distinct but related personalities that are particularly salient in individualistic cultures: narcissism and self-esteem (Cai et al., 2007; Cai et al., 2012). Both of them are distinct from personal uniqueness but are also related to being unique to some extent (Back et al., 2013; Lynn & Snyder, 2002; Nadav et al., 2011; Tesser, 1988). We expected that changes in narcissism and self-esteem would not contribute to changes in name uniqueness.

In testing *H3*, we also tested changes in some other individual demands either for a name itself (modernity, positivity) or for a baby (happiness, achievement, and numerology). We expected that these features would show different patterns of trends from the demand for name uniqueness, thereby providing ecological and discriminant validity for our findings.

We conducted three studies in China to test each of our three main hypotheses. China has undergone unprecedented social change and modernization over the past several decades, with a pronounced increase in individualism (e.g., Hamamura & Xu, 2015; Yu et al., 2016; Zeng & Greenfield, 2015; for a review, see Cai et al., 2019) and increasing acceptance of individualism (Bao et al., 2022). As a result, Chinese society has witnessed increasing emphasis on uniqueness (Cai et al., 2018), independence and competition (Zeng & Greenfield, 2015; but see Santos et al., 2017); Chinese people have shown increasing need for uniqueness (Cai et al., 2018), narcissism (Cai et al., 2012), and self-esteem (Li et al., 2020). At the same time, the prevalence of uncommon names has risen (Bao et al., 2021; Cai et al., 2018; Su et al., 2016). These changes make China an ideal case to test our hypotheses and some potential alternative explanations.

## 2 Study 1

Study 1 tested *H1*. We first demonstrated historical changes in unique naming and cultural values of uniqueness, independence, and competition over years in China. Then, we conducted time-series analyses to test whether shifts in unique naming could be predicted and explained by shifts in the three cultural values.

### 2.1 Method

#### 2.1.1 Name-character uniqueness

**Sample.** We accessed a nationally representative sample of Chinese names from the 2005 China's 1% Population Census (National Bureau of Statistics [NBS] of China, 2005), which was conducted using a three-stage stratified cluster sampling method, with respondents randomly selected from 340 cities in the mainland of China. Our sample was a random subset ( $N = 2585481$ ) drawn by the NBS from the full dataset. To control for potential ethnic confounds, we restricted our sample to Han Chinese. Moreover, to have sufficient sample size for each year, we restricted years to 1920~2005. Finally, we scrutinized the dataset and excluded those who did not have formal names (e.g., recorded as "unnamed"). The final sample consisted of 2148819 individuals. The sample size of each year ranged from 2196 to 48255.

**Measure.** Following previous research on Chinese names (e.g., Bao et al., 2021), we estimated the uniqueness of Chinese names using the R package "ChineseNames" (Bao, 2021), which contained a Chinese name database with nationwide frequency statistics of 2614 Chinese characters used in given

names, covering a population of 1.2 billion Han Chinese. Specifically, we computed an objective index of name-character uniqueness (NU). To control for changes in the popularity of specific given names over time (e.g., Grossmann & Varnum, 2015), we estimated NU with the percentage of a name character used in the Han Chinese population *within* a specific birth year ( $P_{\text{character}}$ )—an approximate estimate for a birth year using the weighted character frequencies of the nearest two birth cohorts (see the `compute_name_index()` function in the R package “ChineseNames”; Bao, 2021). The algorithm was  $NU = -\log_{10}(P_{\text{character}} + 10^{-6})$ , which has been validated as the most appropriate index of name uniqueness in China (Bao et al., 2021).

### 2.1.2 Cultural values of uniqueness, independence, and competition

**Databases.** To obtain valid indices of cultural values at the macro level, we sourced two complementary corpora: the People’s Daily (*Renmin Ribao* [人民日报], the most influential newspaper in China; <http://paper.people.com.cn>) and the Google Books (<https://books.google.com/ngrams/datasets>). The Google Chinese Books corpus, covering a long period (1900–2019), has been widely used to study changes in cultural values in China (Hamamura & Xu, 2015; Yu et al., 2016; Zeng & Greenfield, 2015). It, however, might be subject to selection bias because the Chinese books were selected by several U.S. universities and libraries (Varnum & Grossmann, 2017). In contrast, the People’s Daily, though covering a shorter period (1946–2014), is a more representative corpus. To complement with each other, we constructed indices of cultural values based on (1) the People’s Daily corpus; (2) the Google Books Version 2; and (3) the Google Books Version 3. If we obtained consistent results across these corpora, then the reliability and validity of our findings would be enhanced.

**Measures.** To measure cultural values of uniqueness, inde-

pendence, and competition, we followed previous research (e.g., Grossmann & Varnum, 2015) and developed a dictionary of all related Chinese words for each cultural value. Through a systematic process, we first referred to corresponding questionnaires (in Chinese language) and cultural psychologists’ understanding of these constructs (Oyserman et al., 2002). Then, we selected the most representative Chinese words that are associated with these values and added their synonyms if necessary. Finally, we quantified percentages of words (relative to total word counts) for each year. Table S1 presents the Chinese words we selected (including their English translations and total frequencies). It is worth noting that, unlike English language, many Chinese words may be used as different parts of speech (e.g., both noun and adjective), but they can convergently indicate the same cultural value. There is no reason to suppose only one part of speech in Chinese language could measure a cultural value. Hence, we included all parts of speech of the words we selected (see Table S1).

The raw word frequencies were unstable and had some dramatic rise and fall. To have more robust estimation, we smoothed the raw frequencies by 5 years (i.e., an average of the raw frequencies for a year plus 5 years of values before and 5 years of values after this year).

### 2.2 Results

As shown in Figure 1, we observed overall increasing trends of name uniqueness ( $r_{\text{year}} = 0.56, p < 0.001$ ; Figure 1A) and the cultural value of uniqueness ( $r_{\text{year}} = 0.87\sim 0.93, ps < 0.001$ ; Figure 1B), which replicated the previous findings (Bao et al., 2021; Cai et al., 2018). The changing patterns of cultural values of independence and competition were much more complex and indeed not linear (see Figures 1C and 1D). Nonetheless, all these cultural values demonstrated relatively consistent shifts between different corpora, providing convergent validity for our measures.

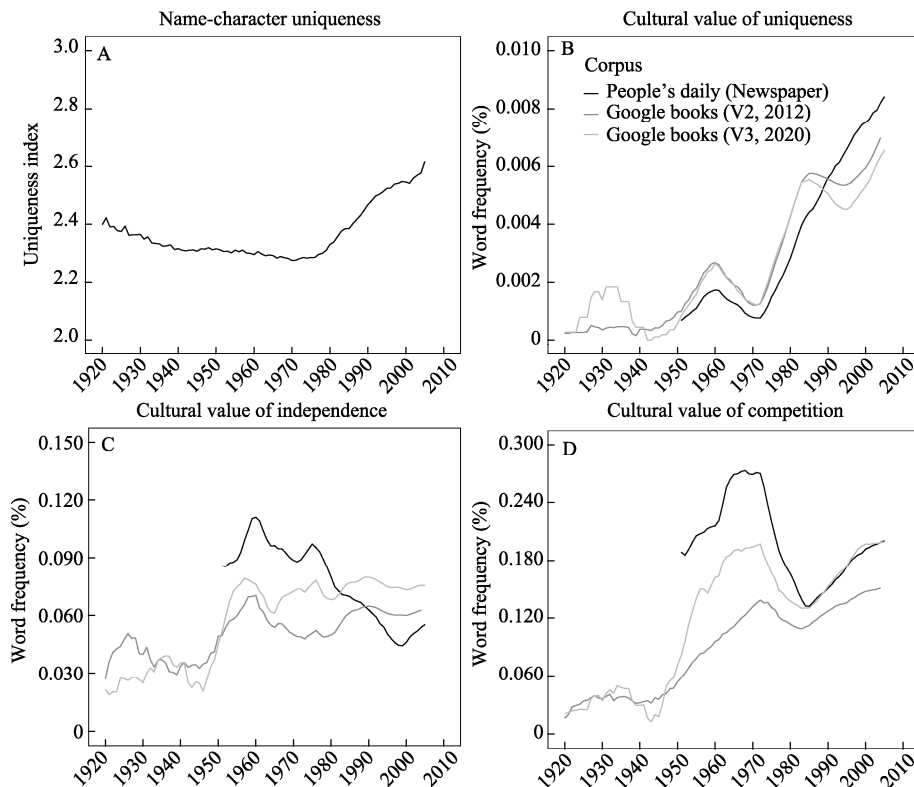


Figure 1. Trends of name uniqueness and three cultural values in China.

To test our main hypothesis, we moved our focus from the historical trends shown in Figure 1 to their cross-temporal relationships. We conducted time-series analyses to examine whether changes in any cultural values could predict and explain changes in unique-naming practices. Using the raw trends would produce spurious results, because the association between two time series may be spuriously strong solely due to third variables (e.g., a temporal trend). Thus, to account for this issue and temporal autocorrelation (Varnum & Grossmann, 2017), we conducted *first-order differencing* for each variable by subtracting its previous value from its current value ( $X_t - X_{t-1}$ ). This is a common method to make data stationary so that no underlying trends would confound the results (Box-Steffensmeier et al., 2014). A first-order differenced variable would denote “changes” rather than “levels” of a construct. The Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test showed that all first-order differenced variables were stationary ( $ps > 0.05$ ).

First, we used cross-correlations to examine the time-lagged relationships between name changes and cultural value changes. Cross-correlations estimate the correlations between two time series at different lags (years). In our analysis, positive lags imply that changes in naming precede cultural value, whereas negative lags imply that changes in cultural value precede naming. As shown in Figure 2, all three corpora consistently revealed that increases in cultural value of uniqueness preceded increases in name uniqueness at 1 year in advance (People’s

Daily:  $r = 0.54, p < 0.001$ ; Google Books V2:  $r = 0.28, p = 0.010$ ; Google Books V3:  $r = 0.25, p = 0.024$ ; Figure 2). In contrast, changes in independence and competition values showed either nonsignificant, inconsistent, or reverse cross-correlations with changes in name uniqueness (see Figure 2).

Then, we conducted Granger causality tests, which also examine lagged effects, to ascertain whether changes in any cultural values explained changes in name uniqueness. The Granger causality test is more conservative than the cross-correlation analysis in that it controls for lags of the outcome variable when testing lags of one predictor. It offers an approach to causal inference in time-series analyses that outperforms purely correlational effects, although this causal inference is not as strong as in experiments. We conducted Granger causality tests at time lags from 1 to 5 years. The results across all three corpora consistently indicated that changes in cultural value of uniqueness explained changes in name uniqueness at 1-year lag (People’s Daily:  $F(1, 50) = 11.62, p = 0.001$ ; Google Books V2:  $F(1, 80) = 7.10, p = 0.009$ ; Google Books V3:  $F(1, 81) = 5.69, p = 0.019$ ; Table 1). In contrast, neither of changes in cultural values of independence nor competition could explain changes in name uniqueness ( $Fs < 2, ps > 0.10$ ; see Table 1).

These results converge with the cross-correlation effects, suggesting that the rising cultural value of uniqueness (but not of independence and competition) specifically predicted and

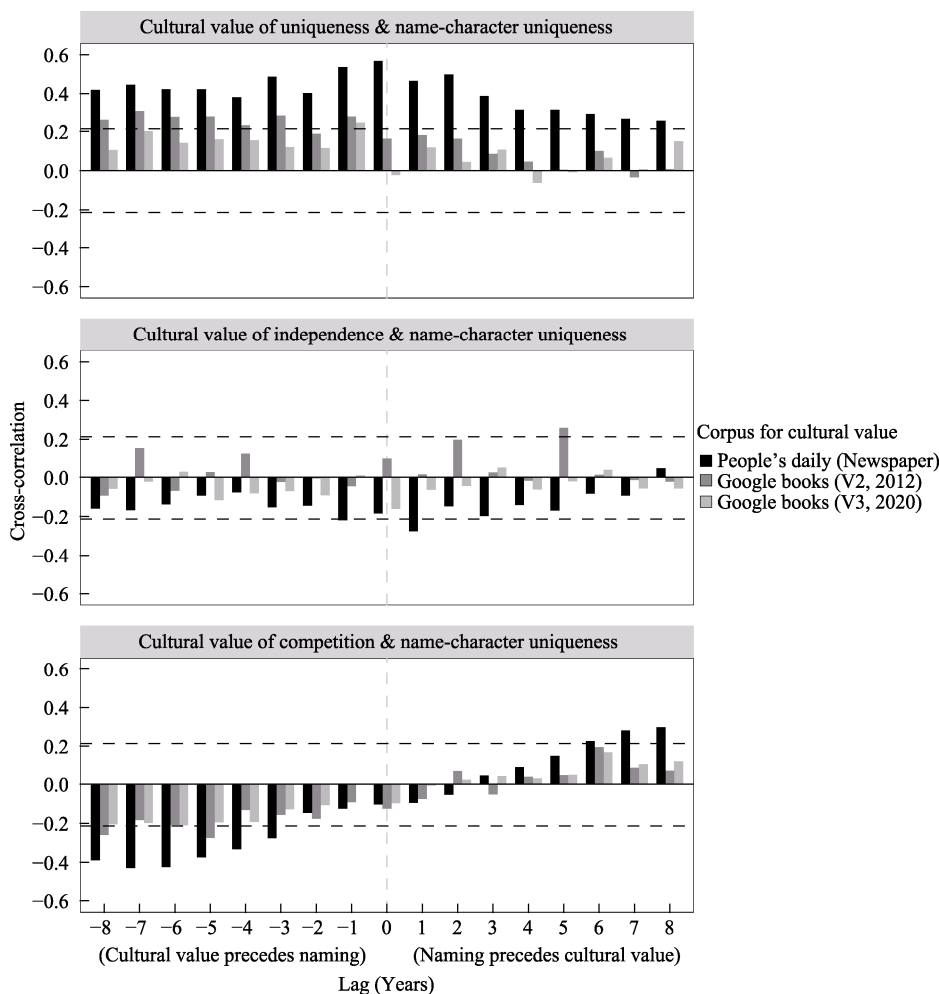


Figure 2. Cross-correlations between changes in cultural values and name-character uniqueness.

Table 1  
Granger causality tests of cultural values predicting name-character uniqueness in China

Lag	F statistics for the hypothesized direction (vs. reverse direction)		
	Cultural value of uniqueness	Cultural value of independence	Cultural value of competition
Corpus: People's Daily			
1 year: $F(1, 50)$	11.62** (vs. 0.00)	1.00 (vs. 1.62)	0.37 (vs. 0.01)
2 years: $F(2, 47)$	4.82* (vs. 1.27)	0.40 (vs. 2.46)	0.13 (vs. 0.10)
3 years: $F(3, 44)$	3.30* (vs. 1.15)	0.69 (vs. 1.79)	1.67 (vs. 0.85)
4 years: $F(4, 41)$	2.27 (vs. 1.03)	0.60 (vs. 1.18)	1.03 (vs. 0.73)
5 years: $F(5, 38)$	2.03 (vs. 0.84)	0.31 (vs. 1.59)	0.94 (vs. 0.77)
Corpus: Google Books (Version 2)			
1 year: $F(1, 80)$	7.10** (vs. 0.72)	0.22 (vs. 0.01)	0.61 (vs. 0.05)
2 years: $F(2, 77)$	2.39 (vs. 0.16)	0.52 (vs. 1.75)	0.93 (vs. 1.79)
3 years: $F(3, 74)$	1.95 (vs. 0.33)	0.12 (vs. 1.43)	0.67 (vs. 2.03)
4 years: $F(4, 71)$	1.62 (vs. 0.65)	0.58 (vs. 1.73)	0.40 (vs. 1.19)
5 years: $F(5, 68)$	1.68 (vs. 0.88)	0.59 (vs. 2.44*)	0.98 (vs. 0.81)
Corpus: Google Books (Version 3)			
1 year: $F(1, 81)$	5.69* (vs. 2.65)	0.04 (vs. 0.00)	0.01 (vs. 0.25)
2 years: $F(2, 78)$	2.31 (vs. 0.76)	0.11 (vs. 0.02)	0.53 (vs. 0.17)
3 years: $F(3, 75)$	1.30 (vs. 1.14)	0.04 (vs. 0.54)	0.59 (vs. 0.28)
4 years: $F(4, 72)$	0.86 (vs. 2.09)	0.07 (vs. 0.70)	1.30 (vs. 0.21)
5 years: $F(5, 69)$	0.93 (vs. 1.40)	0.09 (vs. 0.28)	1.12 (vs. 0.11)

Note. Granger causality test evaluates whether lags of  $X$  predict changes in  $Y$  even when controlling for lags of  $Y$ . Values outside and inside parentheses are  $F$  statistics of Granger causality test for the hypothesized (cultural value precedes naming) and the reverse direction (naming precedes cultural value), respectively.

\*  $p < 0.05$ . \*\*  $p < 0.01$ . \*\*\*  $p < 0.001$ .

explained the increasing unique names in China. Importantly, in both analyses, we used first-order differenced time series rather than raw trends, so our findings were not due to underlying autoregressive trends or a third variable.

### 3 Study 2

Study 2 tested  $H2$  with a large sample consisting of different birth cohorts from 1955 to 2001. We first aimed to validate our measures by demonstrating that younger cohorts had higher need for uniqueness (NFU) and were more likely to give unique names to their babies in a baby-naming task. Then, we tested whether NFU, narcissism, and self-esteem could mediate the cohort effect on naming behavior.

#### 3.1 Method

##### 3.1.1 Participants

We recruited 334 participants online from a wide range of birth years (32.3% male; birth years ranged from 1955 to 2001). The sample was balanced across birth cohorts ( $n_{1955-1969} = 75$ ,  $n_{1970-1979} = 74$ ,  $n_{1980-1989} = 77$ ,  $n_{1990-2001} = 108$ ). We paid each participant 3 Chinese Yuan. A sensitivity power analysis (two-tailed  $\alpha = 0.05$ ) indicated that our sample size of 334 would allow us to detect an effect size of  $r = 0.15$  with 80% power and an effect size of  $r = 0.19$  with 95% power. Participants first completed a baby-naming task and then the measures of NFU, narcissism, and self-esteem.

##### 3.1.2 Baby-naming task

In the baby-naming task, the participants were asked to choose two possible names for their future offspring from each of six lists of Chinese name characters we provided. If they did

not have any children, they were told to choose names for their future children; if they had already had children, they were told to choose names for their grandchildren. They were informed that this baby could be either a boy or a girl.

We developed six name lists according to the Chinese name database (Bao, 2021), with 12 name characters in each list (4 of low uniqueness, 4 of medium uniqueness, 4 of high uniqueness). To rule out possible confounds related to the combination of characters, we selected only single characters as materials for the baby-naming task. Across the six lists of characters, we differentiated "name modernity" (modern vs. neutral) and "name gender" (feminine vs. neutral vs. masculine), controlling character meaning to be relatively positive (see Table S2).

Based on the participants' choices in the task, we coded low-unique names as 1, medium-unique names as 2, and high-unique names as 3 (see Table S2). Since each participant needed to choose two names from each list, the sum score (termed "baby-naming uniqueness") ranged from 2 to 6, with a higher score indicating higher preference for unique baby names. The internal consistency reliability of this measure was satisfactory (6 items:  $\alpha = 0.77$ ; corrected item-total correlations = 0.43–0.58).

##### 3.1.3 Other measures

**Need for uniqueness (NFU).** We measured NFU by addressing both its approach and avoidance aspects—approaching dissimilarity and avoiding similarity (Lynn & Snyder, 2002; Snyder & Fromkin, 1980). For the *approach* facet of NFU, participants completed the Self-Attributed Need for Uniqueness (SANU) scale (Lynn & Harris, 1997) on a 5-point scale (1 =

*strongly disagree*, 5 = *strongly agree*; 4 items:  $\alpha = 0.83$ ). For the *avoidance* facet of NFU, they reported how they might feel (negative vs. positive emotions) when meeting someone with the same name (termed “negative emotions for name duplication”), with 3 items on negative affect (*uncomfortable* [不爽], *annoyed* [厌烦], *embarrassed* [尴尬]) and 3 items on positive affect (*happy* [开心], *friendly* [亲切], *lucky* [有缘]; reversely scored) on a 5-point scale (1 = *extremely weak*, 5 = *extremely strong*; 6 items:  $\alpha = 0.70$ ). To obtain a composite score of NFU, we averaged the standardized scores of these two scales.

**Narcissism.** From the 16-item Narcissistic Personality Inventory (Ames et al., 2006), which consists of 16 pairs of items for narcissism-consistent and narcissism-inconsistent statements, we adopted the narcissism-consistent statements and used a 5-point scale to measure the participants’ narcissistic personality (16 items:  $\alpha = 0.90$ ).

**Self-esteem.** We used the 10-item Rosenberg Self-Esteem scale (Rosenberg, 1965) on a 4-point scale to measure the participants’ self-esteem (10 items:  $\alpha = 0.81$ ).

### 3.2 Results

Descriptive statistics and correlations between variables are presented in Table 2. Younger (vs. older) generations both had a higher level of NFU and were more likely to give babies a relatively unique name, as indicated by the positive correlation between year and NFU ( $r = 0.22$ ,  $p < 0.001$ , 95% CI [0.11, 0.32]; Figure 3A) and between year and baby-naming uniqueness ( $r = 0.32$ ,  $p < 0.001$ , 95% CI [0.22, 0.41]; Figure 3B). Meanwhile, people with a higher NFU were more likely to give

their babies a unique name, as indicated by the positive correlation between NFU and baby-naming uniqueness ( $r = 0.19$ ,  $p < 0.001$ , 95% CI [0.09, 0.29]). After controlling for gender and education, NFU still predicted baby-naming uniqueness ( $\beta = 0.140$ ,  $SE = 0.053$ ,  $t = 2.65$ ,  $p = 0.008$ ; Table 3). Next, we conducted a mediation analysis using the PROCESS() function of the R package “bruceR” with bias-corrected and accelerated bootstrapping method and 5000 simulation samples (Bao, 2023). In doing this, we controlled for gender and education. Results showed that NFU partly mediated the rise in baby-naming uniqueness ( $\beta_{\text{indirect}} = 0.032$ , bootstrap 95% CI [0.007, 0.073],  $p = 0.017$ ), explaining 10.7% of the total effect. Notably, even after controlling for narcissism and self-esteem additionally, NFU still mediated the cohort difference in baby-naming uniqueness ( $\beta_{\text{indirect}} = 0.030$ , bootstrap 95% CI [0.007, 0.067],  $p = 0.009$ ), accounting for 9.9% of the total effect.

Compared to older cohorts, younger cohorts also demonstrated a marginally higher level of narcissism ( $r = 0.10$ ,  $p = 0.057$ , 95% CI [-0.003, 0.21]) but a similar level of self-esteem ( $r = -0.01$ ,  $p = 0.85$ , 95% CI [-0.12, 0.10]) (Table 2). Mediation analyses indicated that neither of them could explain the cohort difference in baby-naming uniqueness (bootstrap 95% CIs of their indirect effects included zero,  $ps > 0.20$ ).

In summary, by using a cross-generational survey, we again found a rising tendency for baby-naming uniqueness. More importantly, we identified that the rise in NFU partly accounted for this tendency. In contrast, neither of the two other theoretically

Table 2

Descriptive statistics and correlation matrix

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Baby-naming uniqueness	3.89	0.76	—					
2. Birth year	1981.59	11.77	0.32***	—				
3. Gender	0.32	0.47	-0.11*	-0.20***	—			
4. Education level	2.45	0.91	0.12*	0.06	0.11*	—		
5. Need for uniqueness (NFU)	0.00	0.76	0.19***	0.22***	-0.05	-0.07	—	
6. Narcissism	3.24	0.65	-0.03	0.10	0.03	-0.07	0.50***	—
7. Self-esteem	2.92	0.47	-0.10	-0.01	-0.06	0.16**	-0.27***	0.07

Note.  $N = 334$ . Gender: 0 = female, 1 = male. Education: 1 = senior high or below, 2 = junior college, 3 = undergraduate, 4 = master’s degree, 5 = doctoral degree.

\*  $p < 0.05$ . \*\*  $p < 0.01$ . \*\*\*  $p < 0.001$ .

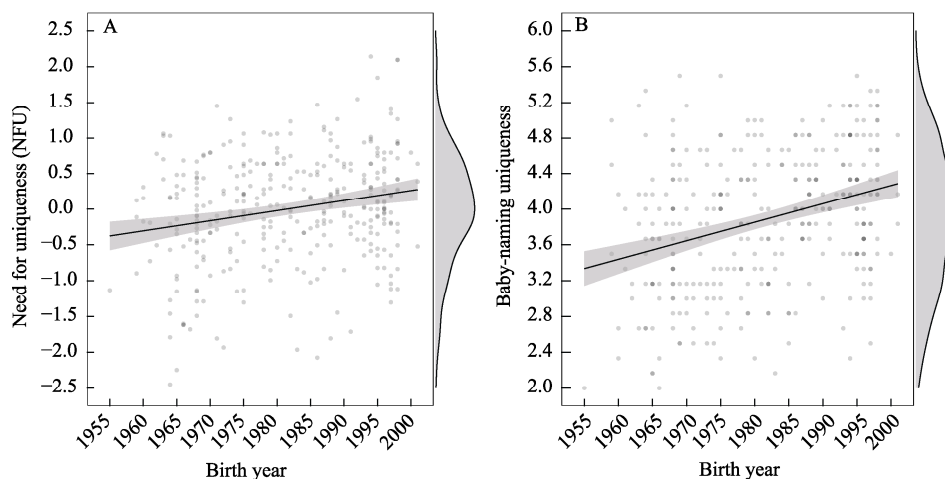


Figure 3. Increasing need for uniqueness and baby-naming uniqueness in China (individual level).

Table 3  
OLS regression predicting need for uniqueness and baby-naming uniqueness

Predictor	Need for uniqueness	Baby-naming uniqueness	Baby-naming uniqueness
Birth year	0.226*** (0.055)	0.300*** (0.053)	0.269*** (0.054)
Gender	0.006 (0.055)	-0.065 (0.053)	-0.066 (0.053)
Education level	-0.089 (0.054)	0.114* (0.052)	0.127* (0.052)
Need for uniqueness	—	—	0.140** (0.053)
$R^2$	0.056	0.118	0.136
Adjusted $R^2$	0.047	0.110	0.126

Note.  $N = 334$ . Standardized regression coefficients ( $\beta$ ) are displayed, with standard errors in parentheses.  
\*  $p < 0.05$ . \*\*  $p < 0.01$ . \*\*\*  $p < 0.001$ .

relevant factors—narcissism and self-esteem—could explain this increase, implying that not all characteristics associated with individualism, but specifically the uniqueness facet, could explain the increase in unique-naming behavior.

#### 4 Study 3

Study 3 tested  $H3$  by analyzing field data on parents' baby-naming demands collected by a naming-service company in China. Besides uniqueness, we also considered other demands for both the name itself (i.e., modernity and positivity) and the baby (i.e., happiness, achievement, and numerology).

##### 4.1 Method

###### 4.1.1 Sample

We obtained a sample of 1460 pairs of parents who submitted their baby-naming demands to a naming-service company in China (*Beijing Meiming Science and Technology Company*). The parents were asked to freely report any thoughts or considerations about their babies' names on the company's website (<https://www.qimingtong.com/application>). Their birth years were collected after they were included in the formal process of the naming service. Since many parents reported identical or similar content, we did not differentiate between mother and father but treated parents as the unit of analysis. The average birth year of parents ranged from 1970 to 1996 ( $SD = 4.48$ ). A sensitivity power analysis (two-tailed  $\alpha = 0.05$ ,  $\sigma_X = 4.48$ ,  $Pr_{(Y=1)} = 0.50$ ) indicated that our sample size of 1460 would allow us to detect an effect size of odds ratio = 1.043 with 95% power in a Generalized Linear Model with binomial distribution (i.e., logistic regression).

###### 4.1.2 Baby-naming demands

All parents applying for the naming service completed an open-ended survey on their "detailed considerations" about baby names. We coded their demands by keyword matching. First, we extracted as many keywords as possible from the raw text and categorized them into six domains (see Table S3 for the dictionary). Three domains included features of names—

*Uniqueness* (8 words), *Modernity* (8 words), and *Positivity* (18 words). The other three domains included features of babies—*Happiness* (10 words), *Achievement* (16 words), and *Numerology* (10 words). The target domain we tested was *Uniqueness*, including almost all Chinese words connoting uniqueness (their translations can be unique, uncommon, unusual, distinctive, and special; see Table S3). To note, the *Numerology* domain included traditional (but pseudo-scientific) beliefs, such as fortune-telling based solely on a baby's name and/or birth time.

To measure whether a pair of parents mentioned any keywords of a domain, we coded the cases who mentioned any keywords of a certain domain as 1 (or not as 0) and performed Generalized Linear Models with binomial distribution to test how each of the six domains of baby-naming demands changed with the parents' birth years. Note that the unstandardized regression coefficient ( $b_{\text{year}}$ ) stands for log odds (Table 4). For interpretation, we also report odds ratio ( $OR$ ) to indicate how much the odds of each demand would change with one year, i.e.,  $100 \times (OR - 1)\%$ .

##### 4.2 Results

Younger (vs. older) parents expressed higher demands for uniqueness of baby names ( $b_{\text{year}} = 0.094$ ,  $SE = 0.021$ ,  $z = 4.43$ ,  $p < 0.001$ , Nagelkerke's  $R^2 = 0.029$ ;  $OR = 1.099$ , 95% CI [1.054, 1.145]) and less emphasis on pseudo-scientific beliefs ( $b_{\text{year}} = -0.026$ ,  $SE = 0.013$ ,  $z = -2.04$ ,  $p = 0.041$ , Nagelkerke's  $R^2 = 0.004$ ;  $OR = 0.975$ , 95% CI [0.951, 0.999]). These results indicated that one-year increase in birth of the parents was associated with 9.9% increase in the odds of demanding name uniqueness and 2.5% decrease in the odds of emphasizing pseudo-scientific beliefs in baby-naming practices in China. In particular, the predicted proportion of parents who emphasized uniqueness of baby names increased from 2.5% in 1970 to 30.3% in 2000 (Figure 4). In contrast, none of the other baby-naming demands significantly changed with birth year of these parents ( $ps > 0.05$ ; see Table 4).

In sum, by examining parental demands in actual naming

Table 4  
Generalized linear models (binomial logit link) predicting parents' baby-naming demands

Predictor	Baby-naming demands (binomial outcome for each case)					
	Features of name			Features of baby		
	Uniqueness	Modernity	Positivity	Happiness	Achievement	Numerology
Birth year	0.094*** (0.021)	0.005 (0.020)	0.020 (0.012)	-0.025 (0.014)	-0.026 (0.015)	-0.026* (0.013)
Total %	10.9	9.2	44.4	21.2	16.5	30.2

Note.  $N = 1460$  pairs of parents. Unstandardized regression coefficients ( $b$ ) are displayed, with standard errors in parentheses. The predictor variable was average birth year of parents. Total % represents the total percentage of parents who mentioned the corresponding feature in the sample, regardless of birth year.



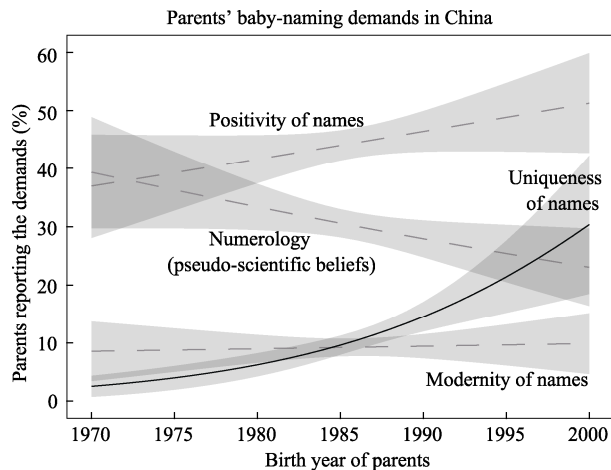


Figure 4. Trends of baby-naming demands (predicted values based on generalized linear models).

practices, we found that Chinese parents increasingly emphasized uniqueness when choosing names for their children. In contrast, such a preference was not evident for many other features of both the name itself (i.e., modernity and positivity) and the baby's welfare (i.e., happiness, achievement, and numerology). These findings provide ecologically valid evidence for the role of the emphasis on uniqueness in explaining the increasing prevalence of unique names.

## 5 General Discussion

Extensive social, psychological, and behavioral changes are happening across the globe (Cai et al., 2019; Kashima et al., 2019; Varnum & Grossmann, 2017), but much less is known about the cultural and psychological mechanisms underlying these changes. As a novel foray into this issue, we examined potential accounts for the increasing prevalence of unique names (Bao et al., 2021; Bush et al., 2018; Cai et al., 2018; Grossmann & Varnum, 2015; Ogihara et al., 2015; Twenge et al., 2010, 2016). We identified that the increasing cultural value of uniqueness explains the increasing prevalence of unique names at the macro level (Study 1) and that the increasing individual need for uniqueness accounts for the increasing preference for unique names at the micro level (Study 2). Moreover, younger parents emphasize uniqueness more than older parents in actual naming practices (Study 3). Together, we provide convergent evidence for the role of rising importance of being unique in explaining the increasing preference for uncommon names, establishing the cultural change mechanisms at both the cultural and individual levels.

Meanwhile, we demonstrate that the increasing prevalence of unique names cannot be attributed to all aspects of individualism by showing that some other distinct but related factors are irrelevant to unique-naming practices. Such factors include two core values of individualism—*independence* and *competition*; two other personality attributes that are particularly salient in individualistic cultures—*narcissism* and *self-esteem*; and other concerns for name (modernity and positivity) and baby (happiness, achievement, and numerology). These findings have ruled out alternative explanations at different levels and highlight that not all individualistic characteristics could explain the rise of unique names.

In addition, all studies have ruled out another alternative explanation that the increasing unique-naming practices might be due to the avoidance of using old-fashioned names. Specifically, in Study 1, we computed name uniqueness *within* the birth cohort of each individual, effectively controlling for the shift in preference from “old” to “new” names across cohorts. Thus, the name uniqueness indicated the degree to which a name was different from peers rather than from older cohorts. In Study 2, we directly controlled for name modernity by distinguishing between “modern” and “neutral” names while avoiding old-fashioned names (Table S2). In Study 3, we directly disentangled the demand for “uniqueness” from that for “modernity” by demarcating the words we selected (Table S3). It was clear that Chinese parents increasingly required baby names to be more unique, rather than more fashionable, in real naming practices over time (Table 4).

Besides providing novel evidence for the rising prevalence of unique names in China and identifying specific mechanisms underlying this shift, our research also has implications for understanding the mechanisms underlying psychological and social changes in general. Many studies have targeted the rising individualism as the main cause for the massive social, cultural, and psychological changes around the world (for reviews, see Cai et al., 2019; Kashima et al., 2019). As an overarching account, this focus seems parsimonious. When it comes to specific changes, this explanation falls short of addressing the complexity of global shifts. Individualism is a cultural orientation consisting of numerous components that are distinct from each other (Oyserman et al., 2002; Vignoles et al., 2016). A specific change may be driven by one (or a few) specific cultural component(s) but not others. Just as illustrated in our present research, not all individualistic components contribute to the shift toward unique name selection; what matters more fundamentally is the culture and psychology associated with uniqueness. Additionally, many studies have also used a uniqueness-related index as an objective measure of individualism, particularly in studying cultural changes (Bazzi et al., 2020; Bianchi, 2016; Grossmann & Varnum, 2015; Ogihara et al., 2015). Is it an appropriate approach? We may agree because unique naming reflects a core value of individualism, that is, being unique. However, we may disapprove because unique naming does not encompass all components of individualism (Vignoles et al., 2016). We must be cautious at least when attempting to draw generalized conclusions. Overall, the findings of our studies suggest that specific mechanisms drive the rapid cultural psychological changes in China. It is necessary to bridge the gap from culture to behavior by theoretically distinguishing the components of culture and empirically testing the specific psychological mechanisms.

Nevertheless, our studies have several limitations. First, we have only considered the case of China. Future research may examine whether our findings hold in other countries or cultures. Second, in Study 1, we measured cultural values using only two corpora: the People's Daily newspaper and the Google Books. Although we obtained consistent findings, future research may replicate our findings using other data sources. Third, in Studies 2 and 3, the age effect might confound the revealed cohort effect. Future replications, particularly those that could distinguish the age effect from the cohort effect, are necessary.



## 6 Conclusion

In conclusion, it is the cultural emphasis on uniqueness that accounts for the rising prevalence of unique names, which showcases a specific mechanism of cultural change that bridges the gap from culture to behavior. Construing the rising individualism as a general mechanism is insufficient and potentially misleading. Future studies should move beyond an overly simple explanation to explore possible specific mechanisms underlying particular social, cultural, psychological, and behavioral changes.

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## 名字独特性上升的成因：宏观和微观解释

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**摘要** 近几十年来, 全球多个国家均出现名字独特性上升的现象, 但具体的变化原因尚不清楚。本研究提出, 宏观水平的独特性文化价值观上升和微观水平的独特性心理需要上升可以解释独特起名行为的增加, 并以中国为例进行实证检验。研究 1 发现, 强调独特性的文化价值观(而非强调独立或竞争的价值观念)的上升可以解释名字独特性的上升, 在时间序列上是其变化的格兰杰原因。研究 2 发现, 独特性需要(而非自恋或自尊)的增长可以解释年轻(相比于年长)个体在起名任务中对独特名字的偏好。研究 3 发现, 在真实起名过程中, 年轻(相比于年长)父母更多强调孩子名字的独特性(而非现代性、积极性或其他特征)。综上, 日益增长的独特性追求(而非个人主义的其他维度或相关特征)是独特名字逐渐兴起的特定原因, 这启示未来研究应关注并检验心理与行为变迁的具体机制。

**关键词** 文化变迁, 个人主义, 独特性, 名字, 中国

**分类号** B848; B849

## Supplemental Materials

Table S1

Study 1: Dictionary of Cultural Values of Uniqueness, Independence, and Competition

Word (Chinese)	Translation (English)	Frequency in People's Daily (1946~2005)	Frequency in Google Books (Version 3) (1920~2005)				
			ADJ	ADV	NOUN	VERB	(Total)
<i>Uniqueness</i>							
独特	unique, uniqueness	17937	197058	0	5336	249448	451842
独一无二	unique, unusual	1096	1776	63	505	15950	18294
与众不同	unique, unusual	1118	0	0	0	2836	2836
另类	unconventional	207	3020	82	488	2223	5813
标新立异	unconventional	63	376	61	2410	3254	6101
特立独行	non-conformity	455	30	0	64	115	209
<i>Independence</i>							
独立	independent(ly)	187056	750408	361216	493010	1032977	2637611
独立性	independence	2327	0	0	21863	0	21863
独立自主	independence	11963	0	0	16225	143645	159870
自主	autonomy(-ous)	49949	255384	215147	434435	77276	982242
自立	self-reliance	4934	0	0	25038	28695	53733
自由	freedom	165240	613884	495097	1938449	170873	3218303
<i>Competition</i>							
竞争	compete(-ition)	90462	0	0	4295832	283358	4579190
争取	strive for	162913	0	0	0	895047	895047
获取	get, obtain	6857	0	0	0	399995	399995
实现	achieve(-ment)	339406	0	0	472091	6418420	6890511
成功	succeed(-ess)	153993	137851	106886	553319	853960	1652016
胜利	win	305971	0	7931	1155882	135071	1298884

Note. The People's Daily newspaper corpus did not differentiate the parts of speech. There is no reason to believe that only one part of speech in Chinese language could measure a cultural value. Thus, we included all parts of speech of the Chinese words.

Table S2

Study 2: Baby-Naming Task

Name modernity	Name gender	Item	Name uniqueness (coding score)		
			Low (1)	Medium (2)	High (3)
Modern	Feminine	1	琳倩雅莹	岚曼沁盈	蕙芊恬宛
	Neutral	2	晨嘉宁思	畅靖玮潇	唯栩榆耘
	Masculine	3	博浩健旭	宸骏韬渊	适嵩骁屹
Neutral	Feminine	4	惠秋蓉月	格妙音竹	蔼筠因纓
	Neutral	5	君润贤彦	纯亭宜知	葆励未晏
	Masculine	6	彬峰恒松	柏滨崇致	实梧逊植

Note. Each row in this table represents one item for measuring baby-naming uniqueness. Participants were asked to select 2 characters from each group of 12 characters that they would prefer for their potential babies, with a score of uniqueness ranging from 2 to 6 for each item. Baby-naming uniqueness was thus computed by averaging the scores of the 6 items. We have matched the valence/positivity of these name characters. Inclusion criteria: (1) name uniqueness—character frequency (parts per million, PPM) in naming practices from 1930–2008, PPM = [1, 100] for high uniqueness, PPM = [100, 1000] for medium uniqueness, PPM = [1000, 10000] for low uniqueness; (2) name gender—relative character frequency  $(N_{\text{male}} - N_{\text{female}}) / (N_{\text{male}} + N_{\text{female}})$  in naming practices, feminine = [-1.00, -0.50], gender-neutral = [-0.25, 0.25], masculine = [0.50, 1.00]; and (3) name modernity—relative character frequency  $[\Sigma(0 \cdot N_{\text{cohort\_pre-1960}} + 0.2 \cdot N_{\text{cohort\_1960-1969}} + 0.4 \cdot N_{\text{cohort\_1970-1979}} + 0.6 \cdot N_{\text{cohort\_1980-1989}} + 0.8 \cdot N_{\text{cohort\_1990-1999}} + 1 \cdot N_{\text{cohort\_2000-2008}}) / N_{\text{cohorts\_all}}]$ , neutral = [0.333, 0.667], modern = [0.667, 1].

Table S3  
 Study 3: Dictionary of Parents' Demands in Baby Naming

Baby-naming demand	Words extracted from parents' free responses
<i>Features of names</i>	
Uniqueness	独特, 独一无二, 与众不同, 特别, 别致, 特色, [不]重名, [不]常见
Modernity	现代, 时尚, 新颖, 流行, 潮流, 前卫, 洋气, 老气
Positivity	好听, 好看, 顺口, 顺耳, 美好, 优美, 高端, 档次, 响亮, 大方, 大气, 寓意, 内涵, 诗意, 雅, 不俗, 脱俗, 不落俗套
<i>Features of babies</i>	
Happiness	快乐, 开心, 幸福, 美满, 和睦, 和谐, 无忧, 吉祥, 如意, 福气
Achievement	成功, 成就, 有成, 事业, 学业, 前程, 前途, 发展, 栋梁, 建树, 出息, 出众, 出类拔萃, 聪明, 聪慧, 睿智
Numerology	八字, 五行, 五格, 生辰, 时辰, 命理, 命格, 八卦, 喜用, 用神