J Happiness Stud (2012) 13:729–744
DOI 10.1007/s10902-011-9288-0

RESEARCH PAPER

The AB Identification Survey: Identifying Absolute versus Relative Determinants of Happiness

Adelle X. Yang · Christopher K. Hsee · Xingshan Zheng

Published online: 25 August 2011

Abstract This article introduces a simple survey method to distinguish between two types of variables that affect happiness—type A, which exerts an absolute effect on happiness, and type B, which affects happiness only through social context. The authors validate the method by comparing its findings with the findings of a theoretically superior but less practical experimental method, and use the method to identify the AB nature of a variety of naturally-occurring variables among both college students and people with work experience. We conclude by discussing the limitation of this method as well as its potential to inform policymakers about where to invest resources in order to improve people's happiness over time.

Keywords Decision making · Happiness · Choice · Affect · Measurement

Some variables are inherently more evaluable and others are inherently less evaluable To say that a variable is inherently evaluable (hereafter referred to as "type A variable"), we mean that human beings have an innate, shared and stable scale to assess which level of the variable is desirable and which is not. Possible type A variables include ambient temperature, amount of sleep, stress, fatigue, and so forth. To say that a variable is inherently inevaluable (hereafter referred to as "type B variable"), we mean that human beings have no innate scale to gauge its desirability, and in order to evaluate its desirability one must rely on external reference information, such as what others have or value. Possible type B variables include the size of a diamond, the brand of a purse, the horsepower of a car, and so forth. Social comparison or social norms (e.g., how big a diamond others possess and

A. X. Yang (✉) · C. K. Hsee
University of Chicago Booth School of Business, Chicago, IL, USA
e-mail: xyang4@chicagobooth.edu; adelleyang@hotmail.com

C. K. Hsee
e-mail: Christopher.Hsee@chicagobooth.edu

X. Zheng
Shanghai Jiaotong University, Shanghai, China
e-mail: xszheng@sjtu.edu.cn

consider desirable) is a prime source of external reference information, and in this research we will use it to exemplify external reference information. It should be noted that type A and type B variables are two ends of a continuum. Most variables are neither purely type A nor purely type B but lie between the two ends.

The distinction between type A and type B variables carries important social implications, as happiness with a type A variable depends on the absolute value of the variable whereas happiness with a type B variable is purely relative, dependent on social comparison. Consequently, in contrasting type A and type B variables, we can propose that improving the value of a type A variable for all the members in a society will absolutely raise the happiness of all, whereas improving the value of a type B variable for all the members in a society is merely a zero sum game and will not raise the happiness of all. The question of whether happiness with external outcomes is relative or absolute has intrigued many students of happiness and generated much debate. Some argue that happiness is purely relative (e.g., Easterlin 1974, 1995; Frank 2000). Others disagree (e.g., Deaton 2008; Diener et al. 1993, 2009; Diener and Biswas-Diener 2002; Johnson and Krueger 2006; Stevenson and Wolfers 2008). We propose that whether happiness with an external variable is relative or absolute depends on the nature of the variable—whether it is inherently more evaluable (type A) or inherently less evaluable (type B). Thus in order to increase happiness over time, we should direct our efforts and our resources to improving type A variables.[1]

Several clarifications are in order. First, one's overall happiness with life in a social context depends on a multitude of factors, such as income, leisure time, health, marital status, and so on. In the present work, we only study the relationship between a specific variable and one's happiness with that specific variable. Unless otherwise specified, when we say 'happiness' in the rest of the article, we mean this specific happiness, not one's overall happiness with life.

Second, to say that a variable (such as temperature) is type A does not mean that the variable is impervious to the influence of external context information; instead, it means that people have an inherent scale to evaluate it and such external context information is not necessary. A person entering a 10°C room will find the room warmer if the outside temperature is −10°C than if it is 30°C (see Zellner et al. 2003, 2006 for recent research on hedonic contrast and its moderating factors). However, even without external references, a person will find a room cold and uncomfortable if its temperature is 10°C or warm and comfortable if its temperature is 20°C. In other words, external reference temperatures are not necessary for one to tell whether the current temperature is comfortable or not.

Third, a type B variable can become evaluable through social learning (e.g., Bandura 1978; Yeung and Soman 2005). For example, one may acquire the knowledge of how to evaluate diamond size by learning from others or observing what others wear and then use the knowledge to evaluate the desirability of a given diamond even without immediate social comparison. This type of evaluability is what we call socially-learned evaluability. A number of real life variables may acquire evaluability by learning from social norms (Schultz et al. 2007; Sherif 1936). However, there is a crucial difference between socially-learned evaluability and inherent evaluability: Socially-learned evaluability (e.g., the desirability of various diamond sizes depends on learning from and comparing with social norms, and can change across time as social norms change. Therefore, improving such

[1] To improve a variable means to change it toward the more desired direction and does not necessarily mean to increase its value. For example, to improve the weight of a laptop computer generally means to decrease the weight.

variables over time is still a zero-sum game. Instead, inherent evaluability (e.g., how high a temperature feels comfortable) does not require such external context and is relatively stable across time. Therefore, improving type A variables over time is not a zero-sum game.

One may wonder whether improvement in type A variables will eventually be erased by hedonic adaptation and hence also become a zero-sum game. Hedonic adaption refers to the tendency to feel affectively less sensitive to a event after one has experienced it for a period of time (e.g., Diener et al. 2006; Frederick and Loewenstein 1999). We believe that both type A and type B variables are subject to hedonic adaptation, but because type A variables have a relatively stable inherent evaluable scale, adaption will not be complete. The hundredth time taking a shower in 20°C water will not feel as dreadful as the first time (hedonic adaption), but it will still feel less comfortable than taking a shower in 40°C (lack of complete adaptation).

Finally, our distinction between type A and type B variables echoes the recent debate about inherent versus constructed preferences (e.g., Bettman et al. 1998; Dhar and Novemsky 2008, Lichtenstein and Slovic 2008; Simonson 2008). Many decision researchers believe that preferences are constructed by task characteristics, the choice context, and the description of options (e.g., Bettman et al. 1998; Lichtenstein and Slovic 2008). However, Simonson argued that much of the evidence for preference construction reflects people's difficulty in evaluating absolute attribute values and tradeoffs and their tendency to gravitate to available relative evaluations, and that there are preferences which are inherent and stable (Simonson 2008). This argument is consistent with our proposition; preferences for type A variables are inherent whereas preferences for type B variables are constructed.

1 Identifying Type A and Type B Variables

The notions of type A and type B variables were originally proposed by Hsee et al., (2009), yet those authors did not operationalize these concepts or introduce a practical method to identify a variable as type A or type B. As a result, the usefulness of the concepts would be rather limited. In this research, we propose a simple survey method to identify the relative type-A versus type-B nature of a variable, and we call it the AB Identification Survey, or simply ABIS. ABIS is not intended to explore the underlying psychological mechanism that makes a variable more type A or more type B; rather, it merely identifies whether a variable is more type A or type B.

For a given variable X, we seek to identify whether h (one's happiness with a specific variable) can be independent of social comparison. Before introducing ABIS, we will first introduce the operational definitions, namely, the experimental method to identify type-A and type-B variables.

1.1 Experimental Method

Suppose that we wish to identify where a given variable X, say, the size of a jade, lies on the type A/type B continuum, assuming that greater X is more desirable. Then recruit respondents and assign them to one of four conditions: comparative-better, comparative-worse, non-comparative-better and non-comparative-worse. Give everyone in the non-comparative-better condition and everyone in the comparative-better condition a jade of a larger size (x_1) and give everyone in the non-comparative-worse condition and everyone in the comparative-worse condition experience a jade of a smaller size (x_2). Isolate the two non-comparative conditions so that members in either of these conditions cannot compare their jade with the jade of members in any other conditions. Combine the two comparative conditions so that members in each of the comparative conditions know what the members in the other comparative condition have. Then ask members in each group to report their happiness about the size of their own jade.

Let $h_{non\text{-}comparative}(x_1)$, $h_{non\text{-}comparative}(x_2)$, $h_{comparative}(x_1)$, and $h_{comparative}(x_2)$ denote the mean happiness levels of the four groups of respondents, respectively. Then we can simply use Equation 1 to determine the AB nature of jade size (X):

$$\text{AB coefficient} = \left[h_{non-comparative}(x_1) - h_{non-comparative}(x_2)\right] / \left[h_{comparative}(x_1) - h_{comparative}(x_2)\right] \quad (1)$$

Note that $h_{non\text{-}comparative}(x_1) - h_{non\text{-}comparative}(x_2)$ reflects X's non-comparative (i.e., absolute) effect on happiness, and $h_{comparative}(x_1) - h_{comparative}(x_2)$ reflects X's total effect on happiness, which is the sum of both the absolute and the relative effects. The AB coefficient reflects the magnitude of the non-comparative effect relative to the total effect. Notice that this ratio is independent of the unit of the target variables, hence making variables of different units comparable. We name this ratio the AB coefficient.

Generally speaking, the total effect should be greater than, or at least equal to, the non-comparative effect, namely,

$$h_{comparative}(x_1) - h_{comparative}(x_2) \geq h_{non-comparative}(x_1) - h_{non-comparative}(x_2) \geq 0,$$

Therefore, the AB coefficient should fall between 0 and 1.

If X is a type A variable, namely, if happiness with X does not require social comparison, then the AB coefficient should approach 1. If X is a type B variable, namely, if happiness with X solely depends on social comparison, then the AB coefficient should be close to 0. If X is a mixture of type A and type B, then the AB coefficient should lie somewhere between 0 and 1.

This experimental method directly captures the comparative/non-comparative nature of type A and type B variables. Nevertheless, if one wishes to identify naturally occurring variables as type A or type B, this method is virtually futile for the following reasons. First, this method requires random assignment of respondents to different conditions (x_1 and x_2), and most variables in the real world are not randomly assigned. Suppose that we want to find out whether men's height is type A or B. The impossibility of assigning men to different heights is self-evident. Second, this method requires that members in the two non-comparative conditions be unaware of the existence of each other. Again, this is rarely possible in real life. Every man knows that there are taller men than him and also shorter men than him. Finally, this method is procedurally complicated and can hardly be applied in large samples. Therefore, we need an alternative method that is both reliable and practical. So we turn to the survey and regression approach—ABIS.

1.2 The Survey Method (ABIS)

In what follows, we first introduce the procedure of ABIS, discuss the advantages and disadvantages of ABIS, then report a study that validated the method, and finally, report two studies to show how to apply this method to identifying a series of naturally occurring variables as type A or type B.

Suppose that we wish to identify whether a given variable X (e.g., the size of a home), is more type A or type B, assuming that greater X is more desirable, and that the average X value in the given population is x_m (e.g., the average size of a home in the U.S. is about 2,300 sq ft in 2010; cite.). ABIS consists of two versions, the comparative version and the non-comparative version. Each version is simple and contains only two questions. The comparative version reads as follows:

1. How large is your apartment? ____ sq ft
2. As you know, some people live in larger homes than others, and the average home size is about 2,300 sq ft. Given that, how do you feel about your home size? Give a number between 1 (very unhappy) and 7 (very happy): _____

The non-comparative version reads as follows:

1. How large is your apartment? ____ sq ft
2. Suppose that you were living in a society where everyone's home size were the same as yours. Given that, how would you feel about your home size? Give a number between 1 (very unhappy) and 7 (very happy): _____

Recruit a sample of individuals (whose home size distribution should be representative of that of the target population), and ask half the sample to answer the comparative version of ABIS and the other half the non-comparative version.[2]

Note that in the comparative version the reference point is the sample or population mean and is constant for all respondents, whereas in the non-comparative version the reference point is the same as one's own value and varies across respondents. The mean information is given as a reference for comparison and may be omitted if it is common knowledge.

After data are collected, run two regressions respectively: one to regress the happiness ratings from the comparative version of ABIS on the target variable X (e.g., home size); the other to regress the happiness ratings from the non-comparative version of ABIS on X. Let $\beta_{\text{comparative}}$ and $\beta_{\text{non-comparative}}$ denote the estimated regression coefficients of X from the two models, respectively. Then we can simply use Equation 2 to identify whether X is type A or type B:

$$\text{AB coefficient} = \beta_{\text{non-comparative}} / \beta_{\text{comparative}} \tag{2}$$

$\beta_{\text{non-comparative}}$ in ABIS is analogous to $h_{\text{non-comparative}}(x_1) - h_{\text{non-comparative}}(x_2)$in the experimental method and reflects the non-comparative effect of X; $\beta_{\text{comparative}}$ in ABIS is analogous to $h_{\text{comparative}}(x_1) - h_{\text{comparative}}(x_2)$in the experimental method and reflects the total effect of X. Generally speaking,

$$\beta_{\text{comparative}} \geq \beta_{\text{non-comparative}} \geq 0, \quad \text{and} \quad \beta_{\text{comparative}} \neq 0,$$

which means that the above ratio, namely, the AB coefficient in ABIS, should fall between 0 and 1. Also similar to the AB coefficient in the experimental method, the more X is a type A variable, the greater the AB coefficient will be; the more X is a type B variable, the smaller the AB coefficient will be.

[2] To make the simulated-non-comparative version parallel to the comparative version, we should have asked respondents to suppose that "the average height of men were the same as your height." rather than to suppose that "every man were of your height." However, pilot tests found that the two questions produced similar results and the "every man" question was easier to understand than the "average height of men" question.

1.3 Discussion

A key advantage of ABIS over the experimental method is that it does not require random assignment of participants to different non-comparative conditions. But this advantage also raises the question about the validity of ABIS. Specifically, part of ABIS relies on respondents' *simulated (imagined)* experiences, and previous research has demonstrated that simulated (predicted) experiences can be different from real experiences (Wilson and Gilbert 2003, 2005). Nevertheless, the existing literature should not be interpreted as indicating that simulated experiences are generally inaccurate. We believe that ABIS is generally accurate. The simulation experience required by ABIS is only a part of the procedure. Everything in the comparative conditions is based on real experiences, and everything except for the "everyone else had the same value" assumption in the non-comparative condition is also based on real experiences. To empirically demonstrate that ABIS is accurate, we have conducted a validation study, which we will report as Study 1.

Since ABIS relies partly on intuition, one may also wonder why ABIS is needed at all, and why researchers cannot just directly draw respondents' intuitions by first explaining to them what type A and type B variables are and then asking them to intuitively judge whether a given variable (e.g., home size) is type A or type B. We believe that ABIS is superior to such direct intuitive judgments for the following reasons: first, ABIS is short and easy to implement whereas the direct intuitive judgments method, which requires the respondents to first understand our definitions of type A and type B variables, is not as straightforward and may take longer. Second, every component in ABIS is based on the respondent's real experience except for the assuming-everyone-else-had-the-same component, whereas everything in the direct intuitive judgment method is hypothetical. As a result, ABIS can be potentially more accurate than direct intuitive judgments. We will return to this point when we discuss the results of Study 1.

The distinction between the experimental method and ABIS as alternative methods to identify A/B variables can be compared to the distinction between the experience sampling method (ESM) and the day reconstruction method (DRM) as alternative methods to measure moment-to-moment hedonic experiences. The ESM (Larson and Csikszentmihalyi 1983) is theoretically superior; it records one's *real* moment-to-moment experiences by requiring the respondent to record and report her current feelings every so often (e.g., every hour). Nevertheless this method is intrusive and hard to implement. In contrast, the DRM (Kahneman et al. 2004) does not measure one's real moment-to-moment experiences; it asks respondents to *recall* their moment-to-moment experiences on the previous day. Although recollections are sometimes fallible, the authors of DRM showed in a validation study that it produced largely similar results to the ESM, and believed that it can serve as a practical supplement or substitute to the EMS. Likewise, ABIS does not entirely capture one's real experiences, but we will also show in a validation study that it produces largely similar results to the experimental method.

2 Study 1: Validation

Study 1 aimed to show that ABIS yields similar results to the experimental method. The study involved a variable assumed to be type A (temperature) and a variable assumed to be type B (diamond size).

2.1 Method

Participants (170 college students from a large public university) were randomly assigned to six conditions: comparative-better, comparative-worse, real non-comparative-better, real non-comparative-worse, simulated non-comparative-better, and simulated non-comparative-worse. The two comparative conditions and the two real non-comparative conditions constituted the experimental method; the two comparative conditions and the two simulated non-comparative conditions represented ABIS.

The study had two within-participant parts, one about temperature and one about diamonds, each part had two levels: better and worse. The order was counterbalanced and had no effect. We describe the temperature part first. Participants in the two comparative conditions were run in a large group. Some were asked to immerse their hands in 40°C water (comparative-better) and others in 20°C water (comparative-worse); they were then asked to try the other water temperature, and then to rate their own water temperature on a 9-point scale (1 = not good at all and 9 = very good).

The two real non-comparative conditions were identical to the two comparative conditions except that those receiving the 40°C and those receiving the 20°C water were run separately so that both groups thought that everyone else had the same water temperature as they did. The two stimulated non-comparative conditions were also identical to the two comparative conditions except that participants were asked to *assume* that everyone else had the same water temperature as they did. Notice that in the two (real) non-comparative conditions, the better-temperature and the worse-temperature recipients were indeed isolated, whereas in the simulated non-comparative condition, the non-comparative situation was imagined. Notice also that the simulated-non-comparative conditions of this study resemble the simulated-non- comparative version of the sample ABIS about home size, in which the respondents know that others' home size is different from theirs but are asked to imagine that all home sizes are the same.

The diamond part of the study paralleled the temperature part. The better and worse stimuli were a large (0.24-carat) diamond and a small (0.10-carat) diamond, and the participants were asked to rate how they would feel if they owned the diamond. We selected these sizes (0.24 vs. 0.10 carat) in order to make the happiness difference between better and worse conditions match the happiness difference with temperatures we selected (40°C vs. 20°C), namely, to make the denominator in our analysis ($h_{non\text{-}comparative}(x_1) - h_{non\text{-}comparative}(x_2)$ similar between diamond and temperature, besides the fact that diamonds in these sizes were common in the market and readily believable for participants.

2.2 Results and Discussion

Table 1 summarizes the results. To calculate the AB coefficient from the experimental method, we used Eq.2, namely, AB coefficient = $[h_{non\text{-}comparative}(x_1) - h_{non\text{-}comparative}(x_2)]/[h_{comparative}(x_1) - h_{comparative}(x_2)]$ where $h_{non\text{-}comparative}(x_1)$, $h_{non\text{-}comparative}(x_2)$, $h_{comparative}(x_1)$ and $h_{comparative}(x_2)$ are the mean happiness ratings in the two real non-comparative and the two comparative conditions. To calculate the AB coefficient from ABIS, we ran two regressions, one using ratings from the two comparative conditions and the other using ratings from the two simulated-non-comparative conditions, derived two coefficients from the regressions, $\beta_{comparative}$ and $\beta_{non\text{-} comparative}$, and applied Eq.3, namely, AB coefficient' = $\beta_{non\text{-}comparative}/\beta_{comparative}$.[3]

The rightmost part of Table 1 summarizes the resulting AB coefficients using the two methods. These results are indeed what we expected. First, the AB coefficient derived from the experimental method was indeed large (close to 1) for temperature and small (close to 0) for diamond size, verifying that temperature was very much type A and diamond size was very much type B. Second and more importantly, the AB coefficients derived from ABIS were remarkably similar to those from the experimental method, again large for temperature and small for diamond. These findings gave us confidence that ABIS could serve as a substitute for the experimental method.

We should mention in passing a seemingly apparent inconsistency between this study and previous research showing the "distinction bias." The current study attested to people's ability to simulate non-comparative situations, whereas the distinction bias refers to the phenomenon that people in comparative situations are unable to accurately predict the experience of others in a non-comparative situation (Hsee and Zhang 2004). How do we reconcile these findings? In the previous research, predictors were given alternative outcomes themselves and asked to predict how *others* would feel when faced with only one of the outcomes. Such procedure made it difficult for predictors to identify themselves with the predictees because they tend to project their own experiences on others (e.g., Loewenstein et al. 2003). In the present research, however, respondents in the simulated-non-comparative conditions have only one outcome themselves and are asked to assume that everyone else has the same outcome as their *own*. This procedure makes simulation easy because participants are not projecting their own experience onto others but simply simulating their own experience by altering a section of the given information. Nevertheless, we speculate that respondents using ABIS may still exhibit some distinction bias (or other prediction errors) in the absolute sense for all simulated conditions, but this is not a serious concern, as we are chiefly interested in the relative AB order of different variables.

The reader may ask whether the reason why the diamonds yielded smaller AB coefficients than did the temperatures was that we selected rather similar diamond sizes (0.24 carat vs. 0.10 carat). We doubt so. First, these sizes differ as much as twice which is an ignorable difference for diamonds. Second, as earlier explained in the Method section, we selected these diamond sizes in order to make the comparative effect for diamond roughly compatible with that for temperature. As Table 1 reveals, while the non-comparative effect for diamond (7.35 − 3.78 = 3.57) was not quite as big as that for temperature (7.25 − 2.05 = 5.20), it was not small in the absolute sense. Moreover, a smaller comparative effect cannot explain why the AB coefficient is also smaller; if anything, the reverse should be true, because $h_{comparative}$ is the denominator, not the nominator, in the AB coefficient calculation.

To see how the survey method compared with intuitive judgments, we recruited another group of participants (n = 31), and introduced the definitions of type A and type B variables to them, namely,

[3] Because we randomly assigned respondents to the better and the worse conditions, X values were discrete, and theoretically, using regression parameters to calculate AB coefficient is equivalent to using mean differences to calculate AB coefficient. Namely, AB coefficient = $\beta_{non\text{-}comparative}/\beta_{comparative} = (h_{non\text{-}comparative}(x_1) - h_{non\text{-}comparative}(x_2))/(h_{comparative}(x_1) - h_{comparative}(x_2))$. Compare this equation with Eq. 1 and the reader will realize that the only difference between ABIS and the experimental method is that ABIS uses simulated-non-comparative means to calculate the non-comparative effect and the experimental method uses real non-comparative means.

Table 1 Stimuli and results of Study 1- the validation study

Variable	Diamond size		Water temperature	
	Better (.10 karat)	Worse (.24 karat)	Better (40°C)	Worse (20°C)
Comparative	7.35	3.78	7.25	2.05
Simulated non-comparative	5.68	5.35	6.50	2.90
Real non-comparative	5.29	5.00	6.73	2.64
AB coefficient from experimental method	**0.081**			**0.78**
AB coefficient from ABIS	**0.092**			**0.69**

> Please read the following information carefully. Some variables are inherently more evaluable and others are inherently less evaluable.
> To say that a variable is inherently evaluable, we mean that human beings have an innate, shared and stable scale to assess which level of the variable is desirable and which is not. For simplicity, we call such variables type A. Social comparison is not needed for evaluating type A variables.
> To say that a variable is inherently inevaluable, we mean that human beings have no innate scale to gauge its desirability, and in order to evaluate its desirability one must rely on external reference information, such as what others have or value. For simplicity, we call such variables type B. Social comparison is a prime source of external reference information.
> It should be noted that type A and type B variables are two ends of a continuum. Most variables are neither purely type A nor purely type B but lie between the two ends.

After that, we asked them to rate the AB nature of two variables by drawing a vertical line on 20-cm horizontal line, anchored by "Type B" on the left end and "Type A" on the right end. The two variables were the size of a diamond and the temperature of bathing water. In coding, the length from the left end to the mark was measured, and the ratio of the measured length with the total length was calculated as the AB coefficient.

The resulting AB coefficients were 0.56 for diamond size and 0.85 for temperature. Like the experimental method and ABIS, the intuitive judgment method also identified temperature as more type A than diamond size. However, the results of the intuitive judgment method were not as close to the results of the experimental method as were the results from ABIS.[4]

Although ABIS is not perfect, to the best of our knowledge, it is the most accurate available option to identify the AB nature of most naturally-occurring variables.

[4] In earlier research (Hsee et al. 2009), the authors also investigated whether people could distinguish between type A and type B variables intuitively. In their research they first explained the definitions of type A and type B variables to research participants and then asked the respondents to rate diamond size and bathwater temperature on a four-point scale ranging from 1 ("definitely belongs to type A") to 4 ("definitely belongs to type B"). Again, the results were in the expected direction (mean ratings were = 1.50 and 3.22 for water and diamond, respectively) but not as close to the experimental results as ABIS.

3 Study 2: Application Involving College Students

To illustrate how to use ABIS, we report two studies that applied the method to identify a series of naturally occurring variables as type A or type B. The current study (Study 2) used college students and the next study (Study 3) used part-time MBA students.

3.1 Method

The study consisted of two phases. The first phase was to select variables that would be used in the second phase; and the second phase, which was the main part of the study, was to identify the selected variables on the type A/type B continuum.

3.1.1 Phase 1

Participants (40 college students from a large public university in China, 54% male; mean age = 20.4) were interviewed individually and each respondent was asked to generate three variables that met the following criteria: (a) they were important to happiness for college students like themselves; (b) every student possessed some value on each of these variables and different students had different values; (c) the values were quantifiable and they knew their own values on these variables. As an example, we told them that air quality was not a good variable, because different students did not experience different air qualities and also because air quality was hard to quantify.

After the respondents had generated variables, they were asked to report their own value on each variable. These values were to be used in the second phase of the study. If different respondents used different units to report values on the same underlying variable, we adopted the most popularly-used unit. For example, some respondents reported vacations in terms of number of destinations they had visited and others reported vacations in terms of number of days they had spent traveling. If number of destinations was the most frequently mentioned unit among the college students, it became the unit for that variable.

A total of 23 distinct variables emerged from the first phase of the study. Most of these variables were mentioned by only one or a small number of respondents. To ensure that the variables to be used in the second phase of the study were of some general importance, we selected those variables that were mentioned by at least 10 respondents, and there were 6 such variables: vacation, winter dorm temperature, dining out, number of friends, home size, and height. To get the representative sample means, we also asked all the respondents to report their own values on these variables.

The first four columns of Table 2 list the names of these variables, the number of respondents who mentioned them, the most-commonly used units, and the means of the variables. It may appear strange that the college students mentioned home size, but not dorm size. The reason is that dorm size was virtually uniform for the students and home size varied greatly; by home size, most students meant the size of their parents' homes in which they still lived.

3.1.2 Phase 2

We recruited another 413 respondents from the same population as for Phase 1 (male = 48.8%; mean age = 20.4), and presented them with the 6 variables selected from

Table 2 Stimuli and results of Study 2 involving college students

Variable	Height	Home size	Friends	Dining out	Winter dorm temperature	Vacation
% of Respondents who mentioned the variable	37.5	25.0	32.5	45.0	30.0	47.5
Mean value in the most commonly used unit	1.74 m for men 1.63 m for women	107 m^2 of construction area	4 close friends	4 times per week	4 degrees (°C)	4 destinations visited in the last 12 months
$\beta_{\text{non-comparative}}$	0.117 0.188	0.009	0.224	0.131	0.199	0.243
$\beta_{\text{comparative}}$	−0.03 −0.01	−0.001	0.029	0.058	0.132	0.175
AB coefficient	**−0.26 −0.05**	**−0.11**	**0.13**	**0.44**	**0.66**	**0.72**

Variables are sorted in ascending order of their AB coefficients, not of their importance. Variables with higher AB coefficients are more of type A, namely, have greater absolute influence on happiness

Phase 1. The respondents received either the comparative version or the non- comparative version of ABIS and completed it individually.

3.2 Results and Discussion

We analyzed the data using Equation 2. The resulting AB coefficients are presented in the rightmost column of Table 2, along with the estimated regression coefficients $\beta_{\text{non-comparative}}$ and $\beta_{\text{comparative}}$. These results are informative. Of these variables, vacation was closest to the type A end of the AB continuum and height closest to the type B end, indicating that vacation has an absolute effect on happiness and height affects happiness mainly through social comparison. Reaffirming the previous findings (the validation study above and the studies in Hsee et al. 2009), temperature veered in the direction of type A.

It is curious to note that some coefficients were negative. That was probably because respondents of the simulated-non-comparative version of ABIS “overreacted” to the same-as-you assumption. For example, suppose that Mr. Short is 1.60 m tall and Mr. Tall is 1.80 m. When Mr. Short is asked how happy he would feel assuming that “every man were of the same height as you are”, he may feel happy, because he feels as if he managed to discard an obvious social disadvantage. By the same token, Mr. Tall may feel unhappy, because he feels as if he has lost a social advantage. Consequently, in the simulated-non-comparative condition, tall respondents may report lower happiness ratings than short respondents, thus resulting in a negative $\beta_{\text{non-comparative}}$, hence a negative AB coefficient. While this issue may lower the absolute values of the AB coefficients, it should not alter the relative order of the AB coefficients. In other words, despite the issue, ABIS remains a useful method to determine the relative AB nature of different variables.

4 Study 3: Application Involving Part-time MBA Students

4.1 Method

To ensure generality of ABIS, we applied the survey in another sample, comprised of individuals who were older and had work experience. The procedure of this study was identical to that of Study 2. Participants in the first phase of the study were 40 part-time master of business administration (MBA) students from a large university in China (male = 67.5%; mean age = 31.8), and participants in the second phase of the study were another 312 students from the same population (male = 66%; mean age = 32.6). Most of the participants were entry or midlevel managers in local companies.

4.2 Results and Discussion

Using the responses from the first phase of the study, we selected all the variables which were mentioned by at least 10 respondents and summarized them in Table 3. Then using the data from the second phase of the study we calculated the AB coefficients of these variables and summarized the results in the rightmost column of Table 3, along with the estimated regression coefficients $\beta_{\text{non-comparative}}$ and $\beta_{\text{comparative}}$.

Although the participants in this study came from a different population than the participants in the first application study, the results of the two studies were rather consistent. For example, in both studies, vacation ranked high in the type A direction and height ranked high in the type B direction. While in both studies vacation ranked high in the type A direction, the absolute AB coefficient was higher for the college student study than for the MBA student study. This difference may have arisen for multiple reasons. First and foremost, vacation was defined differently in the two samples (as number of destinations in one and number of days traveling in the other). It is also possible that the two samples (who had different ages and different experiences) had different inherent need for vacations, or even that the two samples exhibited different measurement biases. Another curious finding was the gender differences: Weight was more type A among men than among women, and height was more type A among women than among men. While this is an interesting result, it is beyond the scope of this research to determine the reliability of these differences.

Income was one of the most frequently-mentioned variables among MBA students, and it also registered in the type B end of the continuum. At the first glance, this result appears incomprehensible: Income can be used to acquire goods and experiences that can likely be considered type A, such as vacations, heating, and medicine. Then why is income type B? Recent research (Hsee et al. 2009) made a distinction between "monetary experience" (the happiness one experiences as she counts the money she has) and "consumption experience" (the happiness one experiences as she uses what she has bought with her money), and found that monetary experience depends mainly on relative monetary levels, whereas consumption experience can depend on both absolute and relative consumption levels. Those findings are consistent with our current findings that income is type B yet vacation and temperature are type A. Happiness with income reflects how respondents feel when thinking about the nominal value of their income rather than the consumption utility of their income.

The type B nature of income identified in this study is also consistent with previous research showing that life satisfaction in developing countries has increased as wealth increased, while in developed countries increase in wealth did not lead to increase in life satisfaction (Blanchflower and Oswald 2004; Easterlin 1974, 1995). This suggests that

Table 3 Stimuli and results of Study 3 involving MBA students

Variable	Car price	Income	Height	Business network	Weight
% of Respondents who mentioned the variable	57.5	70	32.5	27.5	27.5
Mean value in the most commonly used unit	160,000 RMB	140,000 RMB/year	1.75 m for men 1.64 m for women	160 business contact people in cell phone	76 kg for men 58 kg for women
$\beta_{\text{non-comparative}}$	0.067	0.036	0.156 0.264	0.002	−0.043
$\beta_{\text{comparative}}$	−0.008	−0.004	−0.039 0.044	0.00003	−0.016
AB coefficient	**−0.12**	**−0.11**	**−0.25** **0.17**	**0.02**	**0.37** **−0.17**

Variable	Home size	Sickness	Leisure time	Vacation	Insomnia
% of Respondents who mentioned the variable	70	55	37.5	32.5	27.5
Mean value in the most commonly used unit	105 m^2 of construction area	10 sick days in the last 12 months	25 h/week	6 days/year	1 night/month
$\beta_{\text{non-comparative}}$	0.012	-0.127	0.038	0.093	−0.157
$\beta_{\text{comparative}}$	0.002	-0.036	0.015	0.045	−0.108
AB coefficient	**0.17**	**0.28**	**0.39**	**0.48**	**0.69**

Variables are sorted in ascending order of their AB coefficients, not of their importance. Variables with higher AB coefficients are more of type A, namely, have greater absolute influence on happiness people beyond a certain income level spend more income on positional goods rather than functional goods. In other words, when income is low, it is used primarily for type A consumptions; and when it is high, it is used more for type B consumption.

5 General Discussion

In this research we have introduced a simple survey method to identify whether an external variable exerts an absolute influence on happiness or influences happiness only through comparison. We have validated the method by comparing its findings with the findings of a theoretically-superior experimental method, and demonstrated the utility of the method in two application studies.

5.1 Directions for Future Research

The current research is the first attempt at a short and easy-to-implement method to identify type A and type B variables, and it awaits further research to resolve a number of open issues. One issue, as mentioned before, concerns the accuracy of the simulated experience in ABIS. In our validity study, we used only two variables (temperature and diamond) to demonstrate that the simulated-non-comparative responses in ABIS closely resembled the real non-comparative responses in the experimental method. To ensure the validity of ABIS, future research should test ABIS against the experimental method using a wider range of variables.

Another issue concerns the applicability of ABIS. There are several types of variables to which ABIS seems incapable of applying. One type is variables that have little variance across individuals. Suppose, for instance, that in a given society everybody lives in tiny homes and there is little individual difference in home size. In cases like this, both $\beta_{\text{Simulated-non-comparative}}$ and $\beta_{\text{comparative}}$ will be small and the resulting AB coefficient will be unstable. Variables with a non-monotonic relationship with happiness (e.g., temperature) seem also difficult for ABIS, because the regressions in ABIS assume monotonic (even linear) relationships. However, we don't consider this a serious issue. For practical purposes, ABIS will be used to identify the AB nature of a variable among people who care about the variable in a given situation. If people in a given situation care about a given variable, they usually know which direction of the variable is more desirable; for example, most people who care about temperature in winter want warmer rather than colder temperatures; most women who care about their body weight want to lose rather than to gain weight. ABIS can then be used to identify whether temperature (or body weight) is type A or type B among those people, namely, within the range that is pertinent to those people.

Another category of variables that appear to be beyond the reach of ABIS are those which are type A in one range and type B in another range. For example, home size may be type A when the numbers are small and type B when the numbers exceed some threshold. Again, this is not a serious issue. One can test the variable in different ranges separately. We tried this in our study, but we did not find reliable differences between different ranges on home size, probably because of a high homogeneity in the sample: most of our respondents were affluent or from affluent families and few lived in very small homes. (The mean home size of the lowest quartile was 64.2 m^2 in the college student sample and 62.0 m^2 in the MBA student sample.)

Scale recalibration is another potential issue with ABIS. Scale recalibration refers to the phenomenon whereby individuals in different situations interpret the same bounded rating scale differently. If a tall man gives the same happiness rating about his height as a short man, it does not necessarily mean the two men feel the same. Scale recalibration is not a unique problem of ABIS, and it does not seem to be a serious problem for ABIS. While it may have a main effect on the AB coefficients of any variables, it cannot explain why some variables have greater AB coefficients than others (see Hsee and Tang 2007 for further discussion). We find the current ABIS more suitable to identify the relative AB nature of different variables, rather than to establish the absolute AB value of a variable.

Readers might also ask whether using Chinese participants in our studies complicates our interpretations due to possible cultural differences. Undoubtedly, people from different cultures (even different groups within the same culture) have different concerns; for example, Chinese students may consider winter dorm temperature important, while American school teachers may consider commuting time important. We are not interested in such differences. What we are interested in is one's ability to use our method to identify type A and type B variables, and in this respect we have no reason to suspect any systemic cultural differences. Even if one suspects a cultural difference, given the large numbers of Chinese people in the world, it is as reasonable (if not more reasonable) to conduct the initial research using a Chinese sample as to do so using any other sample, and to await future research to generalize the results to other cultures.

Finally, the variables studied in this research are not meant to be the most important variables for happiness. The variables studied in this research were generated and deemed important by the participants in our studies, and they may or may not be important for other populations. The purpose of the current research is not to determine what variables are important for happiness, but to illustrate how ABIS can identify the relative AB nature of a set of variables, however these variables are selected.

5.2 Implications

If further proven to be valid, ABIS can serve as an important tool to help policymakers decide where to invest resources. From the perspective of an individual, improving either type A variables or type B variables will increase happiness: "I will be happier than you if I can afford more comfortable temperature or I can afford more expensive jewelry." For that individual, pursuing both type A and type B variables is rational. But from the perspective of a society, between type A and type B variables, improving type B variables is a zero-sum game and improving type A variables is not.

We do not deny that there are other ways to increase happiness, but we believe that ceteris paribus, improving the level of a type A variable for every member in a society is more likely to increase the overall happiness of the members in the society than improving the level of a type B variable for every member. Thus, resources and efforts should be directed at improving type A rather than type B variables. In Application Study 2, for example, both home size and vacation were considered important by many MBA students, but relatively speaking, vacation was more type A, indicating that resources and efforts should be directed at providing more vacation opportunities rather than building larger homes. The ABIS method we have introduced in this article can serve as a handy instrument for people, especially policymakers, who intend to improve the overall happiness of the members in a society.

References

Bandura, A. (1978). Social learning theory of aggression. *Journal of communication, 28*, 12–29.

Bettman, J., Luce, M. F., & Payne, J. (1998). Constructive consumer choice processes. *Journal of Consumer Research, 25*, 187–217.

Blanchflower, D. G., & Oswald, A. J. (2004). Well-being over time in Britain and in the USA. *Journal of Public Economics, 88*, 1359–1386.

Deaton, A. (2008). Income, health and wellbeing around the world: Evidence from the gallup world poll. *Journal of Economics Perspect, 22*, 53–72.

Dhar, R., & Novemsky, N. (2008). Beyond rationality: The content of preferences. *Journal of Consumer Psychology, 18*, 175–178.

Diener, E., & Biswas-Diener, R. (2002). Will money increase subjective well-being? *Social Indicators Research, 57*, 119–169.

Diener, E., Lucas, R. E., Schimmack, U., & Helliwell, J. (2009). *Well-Being for public policy*. Oxford: Oxford University Press.

Diener, E., Lucas, R. E., & Scollon, C. N. (2006). Beyond the treadmill: Revising the adaptation theory of well-being. *American Psychologist, 61*, 305–314.

Diener, E., Sandvik, E., Seidlitz, L., & Diener, M. (1993). The relationship between income and subjective well-being: Relative or absolute? *Social Indicators Research, 28*, 195–223.

Easterlin, R. A. (1974). Does economic growth improve the human lot? Some empirical evidence. In P. A. David, M. Abramovitz, & M. W. Reder (Eds.), *Nations and households in economic growth*. New York and London: Academic Press.

Easterlin, R. A. (1995). Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior & Organization, 27*, 35–47.

Frank, R. H. (2000). *Luxury fever: Money and happiness in an era of excess*. Princeton, NJ: Princeton University Press.

Frederick, S., & Loewenstein, G. (1999). Hedonic adaptation. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-Being: The foundations of hedonic psychology* (pp. 302–329). New York: Russell Sage Foundation.

Hsee, C. K., & Tang, J. (2007). Sun and water: On a modulus-based measurement of happiness. *Emotion, 7*, 213–218.

Hsee, C. K., Yang, Y., Li, N., & Shen, L. (2009). Wealth, warmth, and well-being: Whether happiness is relative or absolute depends on whether it is about money, acquisition or consumption. *Journal of Marketing Research, 46*, 396–409.

Hsee, C. K., & Zhang, J. (2004). Distinction bias: Misprediction and mischoice due to joint evaluation. *Journal of Personality and Social Psychology, 86*, 680–695.

Johnson, W., & Krueger, R. F. (2006). How money buys happiness: Genetic and environmental processes linking finances and life satisfaction. *Journal of Personality and Social Psychology, 90*, 680–691.

Kahneman, D., Krueger, A. B., Schkade, D., Schwarz, N., & Stone, A. A. (2004). Survey method for characterizing daily life experience: The day reconstruction method. *Science, 306*, 1776–1780.

Larson, R., & Csikszentmihalyi, M. (1983). The experience sampling method. *New Directions for Methodology of Social and Behavioral Science, 15*, 41–56.

Lichtenstein, S., & Slovic, P. (2008). *The construction of preference*. Cambridge: Cambridge University Press.

Loewenstein, G., O'Donoghue, T., & Rabin, M. (2003). Projection bias in predicting future utility. *The Quarterly Journal of Economics, 118*, 1209–1248.

Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science, 18*, 429–434.

Sherif, M. (1936). *The psychology of social norms*. NY: Harper & Brothers.

Simonson, I. (2008). Regarding inherent preferences. *Journal of Consumer Psychology, 18*, 191–196.

Stevenson, B., & Wolfers, J. (2008). *Economic growth and subjective well-being: Reassessing the Easterlin paradox. Brookings Papers on Economic Activity,* Wharton School, the University of Pennsylvania.

Wilson, T. D., & Gilbert, D. T. (2003). Affective forecasting. *Advances in Experimental Social Psychology, 35*, 345–411.

Wilson, T. D., & Gilbert, D. T. (2005). Affective forecasting: Knowing what to want. *Current Directions in Psychological Science, 14*, 131–134.

Yeung, C., & Soman, D. (2005). Attribute evaluability and range effect. *Journal of Consumer Research, 32*, 363–369.

Zellner, D. A., Allen, D., & Parker, S. (2006). Hedonic contrast and condensation: Good stimuli make mediocre stimuli less good and less different. *Psychonomic Bulletin & Review, 13*, 235–239.

Zellner, D. A., Rohm, E. A., Bassetti, T. L., & Parker, S. (2003). Compared to what? Effects of categorization on hedonic contrast. *Psychonomic Bulletin & Review, 10*(2), 468–473.