

# **The Heller School for Social Policy and Management**

Brandeis University

How social and market factors influence the subjective and  
emotional wellbeing of Tsimane', Bolivia

**Submitted by**

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## **1. Executive Summary**

Analyses of developing countries tend to be biased in market as opposed to social directions. The purpose of this thesis is to show how social factors are as significant as market factors in improving subjective/emotional well-being. In this study I consider the association between (a) social factors and emotions, (b) market variables and emotions, (c) and how both are correlated in positive and negative directions. I use 2006 data on 316 women and 329 men over the age of 16 in 13 villages of a farming society in the Bolivian Amazon (Tsimane'). Findings suggest that: (1) social factors are more important for individuals' subjective well-being than market factors. Thus, two out of three social variables revealed strong impact on the emotional well-being of individuals and showed that (2) the family relationship is a significant and important component of subjective well-being; (3) and individuals are affected by peer pressure. Furthermore, the results pointed at no or very low association between market and emotional well-being, when (4) income does not appear to be a prerequisite for individual's well-being, despite the frequent recognition by scholars of being a "sole measure of satisfaction" (Mulligan, 2006, p.23).

## **2. Acknowledgement**

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## **3. Acronyms**

DR

GDP

GWB

NGO

TAPS

UN

Directed Readings

Gross Domestic Product

General Well-Being

Non Government Organization

Tsimane' Amazon Panel Study

United Nations

## **4. Introduction**

For the last few decades the notion of well-being has been debated by scholars all over the world. For developing countries, it is usually equated with economic well-being. Researchers too often imply that social life is somehow a less important component in the human development hierarchy than market forces. This results in comparatively small emphasis on the social attributes of communities in developing countries. Such a limited perspective largely fails to eliminate social ills and unhappiness. “Alongside deprivations, poor men, women and children are able to achieve some elements of what they conceive as well-being,” otherwise, as Gough mentioned, their existence would be distressing (Ian Gough et al., 2007, p.3).

The general idea of this study is that the market and social environment together shape behavior and expectations. Here I seek to highlight the interconnection between both expectations and behavior, because the former determines and sometimes significantly affects the way people react and accept the socioeconomic condition. This is especially important when considering the creation and implementation of development policies of countries in need. Their implementation depends on policymakers in the affected countries considering the suggested policies relevant and acceptable.

### **Learning Objectives**

By the end of my studies at Heller School I hope to be able to formulate relevant solutions to problems confronting government agencies and not-for-profit organizations. Therefore, I have been taking the following courses at the Heller School for Social Policy and Management and in the Conflict and Coexistence Department of Brandeis University:

- International Health Systems
- Coexistence and Conflict –Theories and Analysis
- Coexistence and Conflict – Strategies for Coexistence Interventions
- Development in Conflict Situations

These classes have enabled me to acquire relevant knowledge about development policies and various approaches undertaken by international and national NGOs to meet the needs of populations living in conflict and post-conflict areas. These subjects, as well as the courses taken during my first year at Heller School helped me to develop:

- Knowledge of how non-governmental institutions are shaped by economic, social, and political environments.
- Practical skills and a knowledge base necessary for the management of public-sector organizations - grant writing and donor relations, public relations, electronic communication, and report writing.
- Understanding of how key concepts and theories can be used to formulate practical solutions to problems associated with public and non-profit administration.
- Skills on collecting and analyzing qualitative data relevant to decision-making in public organizations where such data may not be readily available.

Furthermore, the main objective of the second year research study is to test the effect of social and market factors on human well-being, analysis of which could enable me to give recommendations on policy creation and development in one developing country. Therefore, central to the research was determining the set of emotions and also social and market indicators on the basis of which the population could move to a higher level of emotional satisfaction. In order to do that, I took quantitative classes at Heller School. In addition, I registered for a Directed Reading (DR) course that allowed me to learn more about the theory of development and well-being; within the DR I also devoted more time to applying the techniques that I learned during the classes listed below:

- Advance Regression Analysis
- Advance Econometrics
- Health Data Analysis

## **6. Sustainable Development Problem**

*Why well-being is important in development?*

The discussion of well-being in developing countries appears sometimes irrelevant and absurd. This inclination is usually explained by the concern over scarce resources and the deprivation that people experience as consequences of poverty. However, over the decades social workers have been trying to underpin the importance of well-being and its consideration in development. There are few rationales behind it, and the first stands to “acknowledge the fully rounded humanity of poor men, women and children in developing countries; recognizing that they are not completely defined by their poverty; nor can they be fully understood in its terms alone” (Gough et al., 2007, p.3). In addition, one of the main objectives also relates to inability of states and humanitarian agencies to meet expected results and achieve national well-being (Morris, 1967, p.3).

Indeed, as Gough et al. (2007) mentioned in their book, that global community “has been moving towards conceiving ‘development’ as the organized pursuit of human well-being.” That gradually led to enriching the definition of development, moving it from “a narrow economic conception, to encompass human development and wider ideals such as participation and freedom” (Gough et al., 2007, p.4). Thus, ideally the main objective of the development agencies and governments is the creation of fertile ground and the relevant policies for achieving human well-being and respect for his/her freedoms.

Well-being has been at the center of discussions since the ancient times. Aristotle and Socrates and later other philosophers, social activist, and most importantly economists have expressed concern over human well-being and happiness. Moreover, in 1996, Tory leader David Cameron argued for the improvement of people’s happiness and thus suggested the extension of government priorities and interventions from pure GDP to GWB - general wellbeing (BBC, 2006).

Furthermore, the psychologist, Ed Diener, and others held an inquiry on the subject of happiness and satisfaction among college students from 41 countries, both Western and developing states. The research pointed that “On a 7-point scale ranging from 7 (extraordinary important and valuable) to 1 (of no importance of whatsoever), the average student rated life satisfaction as 6.21 and happiness as 6.39” (Diener et al., 1998, p.42). On April 16, 2008, the New York Times had his story comparing happiness across nations. The article described the debates of the researches over the role of income in well-being and questioned Esterlin’s suggestion on low affect of economic growth on satisfaction (cited in Stevenson et al., 2008). Results of the studies support the importance of well-being for individuals regardless of their economic status and the country of origin, whether it is industrialized or developed. Moreover, the researches explained the existent opinion that money causes more satisfaction by the “cultural differences in how people respond to poll questions” (Kahneman, cited in Stevenson et al., 2008).

However, regardless of the studies on the importance of social well-being, the leading working definition of development remains the economic one, “which comprises the material resources people control and can utilize and dispose of, measured by income and at aggregate levels by national income per head” (Gough et al., 2007, p.5).

The biggest development agencies such as the UN and the World Bank aim their intervention policies at economic growth, which according to them is the major tool of development. The World Development Report 2006 highlights the importance of economic equity for a country’s growth, and mentions that “Greater equity is thus doubly good for poverty reduction: through potential beneficial effects on aggregate long-run development and through greater opportunities for poorer groups within any society” (2006, p.2).

Finally, more often than not in the practice of development, emphasis is put more on the economic, material and financial condition of country. However, if we are to achieve genuine sustainable development, development must be viewed in its totality. Hence, the need to examine well-being from the social and from the psychological sides is integral to development.

## **7. Definition of the Development Question**

The main motivation for analyzing subjective social and psychological well-being is because it is a key component of the sustainable development. This emphasis might imply the reconsideration of current development policies and strategies or the improvement of well-being by creation appropriate institutions as suggested by Seifert (2002). This study on the social and psychological well-being however, does not reject and undermine the role of economic welfare. Moreover, it does acknowledge the importance of the economic growth in the development of states and most importantly in human's life.

The main hypothesis of this study is that both market and social factors are equally important for subjective well-being. Here, I refer to the definition of subjective well-being as a person's evaluation of his or her life. In this study, I do not distinguish emotions from feelings, affects, moods or sentiments, as Peggy A. Thoits (1989, p.3) tried to do in her study on the sociology of emotions. However, I am using her description of emotions as a main definition, which involves: "(a) appraisal of a situation stimulus or context, (b) changes in psychological or bodily sensations, (c) the free or inhibited display of expressive gestures, and (d) a cultural label applied to specific constellations of one or more of first components" (Thoits, 1989, p.3). Thus, while describing emotional well-being, I refer to visceral factors, which incorporates a range of negative and positive emotions such as anger, fear, stress, regret, sadness, happiness, and smile (Loewenstein, 2000, p.2), and drive states (alcohol and cigarette addiction).

## **8. Data and methods**

Data for the research was drawn from the Tsimane' Amazon Panel Study (TAPS) (in progress), which started in 2002 in 13 villages along the Maniqui River, Department of Beni. The study traces the life pattern of Tsimane', a farming and foraging society going through "rapid integration into the national and international market economy" (Leonard & Godoy et al., 2008, p.4). TAPS includes roughly 332 households and about 1,985 people in 13 villages that differ in their proximity to the nearest market town, San Borja. On average, a village is about 25.96 km away from the town. TAPS records "the effects of exposure to the market economy and to the modern world on a broad range of

socioeconomic, cultural, health, psychological, and biological indicators of well-being (Leonard & Godoy et al., 2008, p.4).

For this study I used data from the 2006 survey done among 316 women and 329 men over the age of 16 living in different households. The information was collected by three interviewers from Bolivia and three Tsimane' translators who had been working on the study since its beginning (Godoy et al., 2006, p.5).

To test the hypothesis about the equal importance of social and market factors for human well-being, I organize this study by two major approaches. I trace and compare the effect of both factors on the emotional well-being of Tsimane'. I treat the emotions as dependent variable and market and social factors as explanatory variables.

Finally, drawing on the importance of social and market factors in the well-being of individuals, I also admit that there is a range of other factors that affect the emotional state of individuals. Therefore, in the econometric model I control for clothing, expenditures, sex, age, height, household size, education, and food (how well did you eat?).<sup>1</sup>

## **9. Literature Review**

In this section I will present the opinions and findings of other authors on the topics of (1) subjective well-being and its importance for people (2) and the role of emotions in social and economic theory.

### *10.1. Subjective well-being and its importance for people*

The notion of well-being can be defined from both narrow and broad perspectives. "In narrow economic terms, it has been simply identified with wealth and prosperity; while in an equally narrow biomedical sense it has been equated with good health" (Mulligan et al., 2006, p.22). Fitting more than lack of problems and good health (Ryff & Singer cited in Diener et al., 1998, p.34) well-being is also regarded from both psychological and physical state of individuals, and is related to human happiness and life satisfaction (Mulligan et al., 2006, p.22, Gough et al., p.4).

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<sup>1</sup> See Table 1 for more information

Subjective well-being is an essential component of positive well-being and dictates how a person evaluates his/her life: “This valuation can be in terms of cognitive such as satisfaction of marriage, work, and life, and it can be in terms of ongoing affect (the presence of positive emotions and moods, and the absence of unpleasant affect) (Diener et al, 1998, p.34).

However, measuring well-being on the scale of happiness and satisfaction create additional problems. For example, the surveys moderate the importance of components of well-being that cannot be quantified, but also overstress “the thematic of satisfaction to a point where we are left with a utilitarian ‘pleasure-principle’ calculus of happiness”. (Mulligan et al., 2006, p.24). Eckersley states that “well-being can certainly coexist with feelings of unhappiness or dissatisfaction or one might want to move beyond a pleasure/satisfaction based understanding of wellbeing in order to incorporate more abstract ideas about what gives life meaning” (2004, cited by Mulligan et al., 2006, p.24).

On the other hand, people are driven by feelings of mastery and enthusiasm, fascination by the appealing and pleasurable activities, and positive social relationships. The driven states and feeling, such as “purpose, connections, mastery, and positive self-regard are some of the paths to subjective well-being” (Diener et al, 1998, p.34).

Finally, the emphasis on the importance of subjective well-being has been in place since at least 14<sup>th</sup> century, when it pointed toward both happiness and satisfaction (Gough et al., p.4; Diener et al, 1998, p.34). British thinkers John Stuart Mill and Jeremy Bentham accentuate the central role of happiness and maximization of subjective well-being for the good of society (as cited in Diener et al, 1998, p.34).

### *10.2 Emotions in economic and social theory*

In recent years, both psychologists and economists have examined emotional basis of personal behavior (Loewenstein, 2000, p. 2). Their interest to the subject can be explained by the recognition “that humans are not motivated solely by rational-economic concerns. Emotional attachments to others and affective commitments (e.g. desire, attitudes, values, moral beliefs) influence a significant portion of human behavior” (Etzioni 1988, Hochschild 1975 cited in Thoits, 1989, p.317). Despite the common interest to examine human emotions and people’s behavior, the two fields of studies are focusing on different emotions and time perspectives. Economists for example, have studied the anticipated emotions, such as regret and disappointment, “which are not experienced at the time of the decision-making, but are expected to be experienced in the future”; whereas, psychologists have focused more on immediate emotions, “emotions that are experienced at the time of decision-making” (Loewenstein, 2000, p. 426).

The definition of “emotion involves: (a) appraisal of a situation stimulus or context, (b) changes in psychological or bodily sensations, (c) the free or inhibited display of expressive gestures, and (d) a cultural label applied to specific constellations of one or more of the first three components” (Thoits, 1989, p.318). The range of negative (fear, anger) and/or positive (happiness, smile) emotions, but also drive states (thirst, addiction, sexual desire), and feelings states (e.g. pain) motivates and shape people’s behavior (Thoits, 1989, p.318; Loewenstein, 2000, p. 426). Emotions also “determine the trade-offs that people make between different goods and activities: hunger, for example increases one’s preference for food” (Loewenstein, 2000, p. 426).

The examination of both positive and negative emotions promotes the understanding of “daily functioning but also often propel behavior in directions that are different from that dictated by a weighing of long-term cost and benefits of disparate actions” (Loewenstein, 2000, p. 426).

#### *a) Positive emotions: Happiness and Smile*

In 1998, the psychologist Martin Seligman proposed to analyze positive emotions, when he put forward the idea of “positive psychology”. According to him it “is the scientific study of the strengths and virtues that enable individuals and communities to thrive”. Positive Psychology is based on three pillars, which are positive emotions, positive traits, and positive institutions (cited in Huang, 2008, p.2; Halpern, 2008). Positive emotions can be classified by “when they occur into contentment with the past, happiness in the present, and hope for the future” (Seligman et al., 2004).

#### *Happiness*

Debates over the concept of happiness have taken place since ancient times. “Aristotle’s eudaemonia, most often translated as ‘happiness’, was considered by him to be the final and sufficient goal for which all other goals were sought” (Diener et al, 1998, p.34). Happiness among life and liberty was mentioned in the United States’ Declaration of Independence of 1776 as an “unalienable right” (Frey et al., 2002, p.402). Some researches classify “traditional theories of happiness into three categories: 1) hedonism, which views happiness as experiencing positive subjective feelings; 2) desire theory, which views happiness as fulfilling subjective desires; and 3) objective theory, which views happiness as achieving items from some objective list of worthwhile pursuits or things” (cited in Huang, 2008, p.2). The general definition of happiness reflects pleasant, good and meaningful life and therefore “combines all three traditional theories of happiness in the sense that pleasant life conceives of happiness in a hedonic sense, a good life conceives of happiness and desire sense, and a meaningful life conceives of happiness in an objective list sense” (Huang, 2008, p.2).

The findings of Ed Diener reveal that social economic status is not on the priority list of “worthwhile pursuits or things” and point out the insignificance of the respective status factor. Diener’s study reflects the overwhelming negative responses on the questions such as “Are those people who go to work in suits happier and more fulfilled than those who go to work in overalls? Do people higher on the socioeconomic ladder enjoy life more than those lower down? Can money buy happiness? Are black Americans less contented on average than white Americans? Are men happier than woman?” (cited in Halphern, 2008).

Bruno S. Frey and Alois Stutzer, on the contrary, pointed out that happiness is relevant to economics because of the effect of institutional environment including quality of governance and impact and size of social capital on the individual well-being. “Research for 49 countries in 1980s and 1990s suggests that there are substantial well-being benefits from the factors such as improved accountability, effectiveness and stability of government, the rule of law, and control over corruption” (Frey et al., 2002, p.402). Referring to Loewenstein and Kahneman’s works, Frey also mentioned the role of happiness in the subjective well-being, especially “whether people can successfully predict their own future utilities or whether individual self assessments of predicted, instant and remembered utility are consistent” (Frey et al., 2002, p.403).

Lastly, the researches underpinned the importance of happiness and concluded that it requires “the most encompassing measures”. Lacking physical attributes, happiness is a feeling that can be interpreted in different ways, and therefore depending on the purpose of the study the researches approach happiness from their “particular ideological perspectives (how it relates to the common good, for example or to the function of markets) (Halper, 2008). However, the main results pointed out that income does not necessarily play the main role in human happiness, but it mainly depends on the set of social factors such as family relationship, friendship, and work satisfaction including the range of some other activities (Deutsche Bank Research, 2008, p.1).

### *Smile.*

Regardless of its apparent simplicity and nature, researches argue about the important effect of smiles on people’s life (Godoy et al., 2004). There are the two types of smile, i.e. genuine or felt and false or posed smile, which correlate with different physiological and social determinants, and sometimes with the culture. People relate the felt smile with natural feelings of enjoyment, friendliness and happiness (Godoy et al., 2004), whereas “posed smiles have a pro-social component and arise from people’s conscious effort to smooth social interactions (Saarni & Weber, 1999).

In 2004, Godoy and others hypothesize that “People who display mirth openly might earn more, but people who earn more might display mirth more openly” (Godoy et al., 2004). Therefore, researchers dispute over the positive correlation between smile and economic outcomes. Deutsh in its turn assumed that smile negatively correlates with social rank (1990), socioeconomic status (Amick et al., 2000), dominance (Mazur, Mazur & Keating, 1984; Mueller & Mazur, 1996), and testosterone (Dabbs, 1990, 1997; Dabbs, de la Rue, & Williams, 1990), and could be stable over the life cycle (Godoy et al., 2004). Moreover, the experimental studies showed that smiling promoted cooperation and trust between individuals (Godoy et al., 2004, p.5).

Assuming that smile should promote greater trust, collaboration and positive reciprocity, Godoy et al. argue that smiles might lead to the high pays-off in pre-industrial natural settings in the community, which lead to the cooperation between customers and creditors, when the last ones might trust more people who smile. Moreover, “since smiles convey friendliness and induce positive reciprocity, people who smile should receive higher wages and higher prices for their outcome” (2004, p.5). Finally, the increased trust and cooperation between people would invest more into the well-being of individuals through increased social capital, improved health and high income (Godoy et al., 2004, p.5).

#### *b) Negative emotions*

In the article on “Emotions on Economic Theory and Economic Behavior” Loewenstein treated visceral factors as a range of negative emotions. He states that regardless of the historically negative opinion on the destructive effect of visceral emotions, they are acknowledged as being critical in the human development process. “Deficiency in any visceral factor decreases an individual’s quality of life, chances of survival, or likelihood of reproducing” (2006, p.427). Willson refers to the fact that “people who lack pain receptors accidentally mutilate themselves, and even subtle emotional deficits can have dramatically negative consequences for functioning (1991, 1994).

Thus, visceral factors are considered by many researches as having “an erratic and unpredictable influence on behavior”. However Loewenstein stated that changeability in visceral feelings should not be confused with unpredictability, as supposed to “cognitive deliberations, which are commonly seen as the source of stability in behavior, are the major source of unpredictability” (2006, p.427).

Furthermore, the empirical analysis of Susan Gore and others suggested that various negative effects are connected with negligence and drug and alcohol misuse (Gore et al., 2000, p.257).

In the research on the alcohol addiction in Bhutan, Chenchu Dorji mentioned that though drinking in the country is related to social, cultural, religious and traditional practices, the individual disposition to liquor “depends upon biological and psychological factors” (2004, p.5). Earlier, in 2002, the research regarding alcohol misuse in a Venezuelan native population also revealed socio-cultural association with the problem. The study acknowledged the awareness of the population on the destructive effect of the alcohol and later alcohol-related problems, such as legal and health problems, as well as violence. Seal and others note that “Current alcohol related problems appear to have their roots in both earlier cultural patterns of alcohol use (i.e. binge drinking when alcohol was available) and in changes that occurred as a result of contact with Western society (Seale et al., 2002, p.202). Later, Dorji expressed concern with individuals’ tolerance to alcohol and its usage as a coping and protective mechanism against negative feelings and circumstances. With progressing addiction to alcohol the perception of life a sequence of negative unbearable events increases, which also leads to “deterioration of their health, their sense of well-being and social life” (Dorji, 2004, p.6).

Lowenstein mention that people are likely to neglect and or undervalue the impact of visceral emotions on their current or future behavior, as they are unable to memorize their feelings in the past. They tend to underestimate the consequences and or effect of negative emotions usually while being in a cold state. Likewise, when in a “hot” state (i.e. craving, angry, jealous, sad etc.) people have difficulties imagining themselves in a cold state and thus miscalculate the speed with which such state will disappear” (Lowenstein, 2000, p.428).

However, regardless of people’s tendency to forget about their visceral states, the emotion *regret* projects past emotions on the current or future behavior. Thus, “regret is a negative, cognitively determined emotion that we experience when realizing or imagining that our present situation would have been better, had we acted differently” (Zeelenberg, 1996, p.6). Therefore there is no reason for individuals to regret negative outcome, unless it was “caused by the decision maker himself or herself that he or she could not prevent happening, and for which he or she does not feel responsible” (Zeelenberg, 1996, p.255).

Finally, Easterlin argues that psychologists see the clear cut between decision utility and experienced utility. He says that “decision utility is a perceived satisfaction associated with choice among several alternatives; experienced utility is the satisfaction realized from the outcome actually chosen” (2001, p.10). From the economists point of view there is no difference between decision utility and experience utility. According to this theory “if one’s interest solely in the choices determining behavior, then decision utility is enough. But if one is interested in the welfare effects of behavior, then the effect of the income-aspiration mechanism on experienced utility needs to be taken into account” (Easterlin , 2001, p.10)

Having reviewed the existing literature on subjective well-being and role of emotions in the economic and social theories I would like to highlight the following. Though the authors acknowledged the importance of subjective well-being, they did not reach mutual consent on the equal weight of social and economic well-being.

## **10. Evidence and analysis**

This section will discuss the results of the statistical analysis that were undertaken to test the hypothesis of the research. The results are described in three separate sections (univariate analysis, multivariate results, and robustness). The more detailed description of the outcome is presented in Tables 1 - 3.

## 10.1. Univariate analysis

Table 1 contains the definition and summary statistics of variables used in the regression analysis.

Table 1. Definitions and summary statistics of variables

Variable	Definition	N	Mean	Std Dev	%
<b>Dependent variables</b>					
Anger	Number of times person felt angry last week	679	.69	1.27	
	0	428			63.03
	1+	251			46.97
Fear	Number of times person felt afraid last week	679	1	1.36	
	0	333			49.04
	1+	346			23.71
Stress	Number of times person felt that he/she could not control things	679			
	0=never, almost never	366			53.90
	1=sometimes, frequently, very frequently	313			46.10
Happiness	Number of times person felt happy last week	679	2.49	2.31	
	0	73			10.75
	1+	606			89.25
Addiction	z-score of addiction based on principal component factor analysis of number of times the person was drinking alcohol and smoking during the last seven days	679	3.01	1	
Sadness	Number of times person felt sad last week	679	1.69	1.95	
	0	209			30.78
	1+	470			69.22
Regret	(1) Number of times person expressed regret at having bought durable good last year	677	2.58	2.54	
	0	175			25.85
	1+	502			74.15
	(2) Did the person regret having borrowed money?	678			
	No	665			98.08
	Yes	13			1.92
Smile	Whether or not the subject was smiling during the interview	679	2.81	.98	
	0 = no smile/laugh, smiled without laughter	247			36.38
	1 =smiled & laughed many times, guffaw	432			63.62
<b>Explanatory variables:</b>					
<b>Market</b>					
Income	Total income in <u>bolivianos</u> (1 US = 7.64 <u>bolivianos</u> )	679	127.9	224.4	
Credit given	Total <u>bolivianos</u> in credit given out by person.	679	12.18	78.30	
Modern wealth	Value in <u>bolivianos</u> of modern physical assets (e.g., rifles, knives, radio, watch) owned by the person	679	732.46	750.71	

Variable	Definition	N	Mean	Std Dev	%
<b>Explanatory variables:</b>					
<b>Social</b>					
Anger at family member	How often a person got mad at members of his/her family in last seven days	679			
	0=never	389			57.29
	1= often, sometimes	290			42.71
Health	Current health status of heath of the person	679			
	0=good	351			51.69
	1=poor, ok	328			48.31
Gossip	Number of self-reported times relatives of the person gossiped about the person	679	.91	1.69	
	0	390			57.44
	1+	289			42.56
<b>Control variables</b>					
Clothing	Amount of clothing person has	679	.21	.44	
	Little	542			79.82
	Enough	129			19.00
	Lots	8			1.18
Expenditures	Number of purchases in last 7 days (0=many times; 1=few times; 2=never)	679	.96	.69	
Food	How well the person ate in last 7 days	679			
	poorly	15			2.21
	ok	365			53.76
	well/good	299			44.04
Household size	Number of people in the household	645	7.34	2.79	
	3+	611			94.42
Age	Reported age of subject in years	645	38.07	18.92	
Sex	Sex (person over 16)	645			
	Female (0)	316			48.99
	Male (1)	329			51.01
Height	Person's standing height (in cm)	645	6.72	2.91	
Education	z-score of subject's skills (Spanish; mathematics; maximum years at school attainment; participation in any additional trainings).	567	0.33	1.11	

***Dependent variables:***

I used nine dependent variables to capture a range of emotions: Anger, fear, stress, happiness, addiction, sadness, regret, and smile. To evaluate the emotional state of Tsimane' the surveyors asked several questions (e.g. whether the person was feeling happy last week). Thus the respondents self-reported their feelings except for the smile, which is based on observations of the surveyors.

(1) Anger: To measure anger, the surveyors asked the participants to report how many times they were feeling angry during the previous week. 63.03% of the respondents reported not being angry, and 19.73% were angry at least once. Later in the econometric model I used a Tobit regression due to the high percentage of negative answers (63.03 out of 100%).

(2) Fear: On the question “How many times did you feel afraid during the last seven days” 49.04% of respondents replied that they had never been afraid and 23.71% said that they were afraid at least once. In the econometric model I used a Tobit regression due to the high percentage of negative answers.

(3) Stress: The question was framed as “Last month how many times did you feel you couldn’t control things in your life”. The question had the following results: (1) never = 33.43%; (2) almost never = 20.47%; (3) sometimes = 32.99%; (4) frequently = 11.34% and (5) very frequently = 1.77%. I generated a dummy variable for stress, (the answers “never” and “almost never” were equal to “0” and the answers “sometimes”, “frequently” and “very frequently” were equal to 1). As a result, 53.90% of the questioned population reported that they have never or almost never lost control over the situation, and 46.10% replied that sometimes they could not control things in their life. In the econometric model I used a probit regression.

(4) Happiness: The range of answers on the question “How many times did you feel happy during the last week?” ranges from 0 to 20. On average people felt happy 2.49 times per week, and about 26% of responded reported that they were happy at least twice. Because the dependent variable is continuous and its values are normally distributed I used OLS regression.

(5) Addiction: The variable addiction was generated using the principle component factor analysis of number of times the person was drinking alcohol and smoking during the last seven days. The variable was generated on the basis of the below survey questions:

1. In last month, how many times did you get drunk?
2. How many times did you drink alcohol in the last 7 days?
3. How many liters of alcohol did you drink in the last 7 days?
4. How many liters of beer did you drink in the last 7 days?
5. How many industrialized cigarettes did you smoke in the last seven days?

(6) Sadness: The question “How many times during the last week did you feel sad?” received 30.78% of negative (zero/no) answers. Therefore in the econometric analysis I used a Tobit regression. The answers range from 0 to 14 times and on average people were feeling sad at least twice per week (SD= 1.94: mean = 1.69).

Regret: Furthermore, because regret, unlike the other negative emotions can be only caused by the decision maker (Zeelenberg, 1998, p.255) I used two survey questions, which dealt with regret at borrowing money and regret at durable goods in the last year.

(7) Regret: During the survey several questions were asked about regret. For this analysis I have chosen two variables that are the most appropriate and reflective for the present study. Thus, the question on “Number of times the interviewee expressed regretted at having bought goods during the last year” received 25.85% of negative (zero) answers. The answers range from zero to eighteen, and on average people regretted purchases approximately 2.5 times per year (SD= 2.54). The large number of zero answers explains the use of a Tobit regression.

(8) Regret: The second question on regret was related to money borrowed. The overwhelming majority (98.08%) has not regretted borrowing money and only 1.92% of the interviewed population expressed regret.

(9) Smile: The variable smile is measured on the basis of the interviewers’ observations on whether a person (1) neither smiled nor laughed, (2) smiled without laughter, (3) smiled and laughed many times, (4) guffawed. In the regression analysis I used a dummy variable smile (an answers no smile nor laughter and smile without laughter were coded as zero (0) and respectively smiled and laughed many times and guffawed were coded as one (1)).

### ***10.1.2. Explanatory variables:***

#### ***Market variables:***

To estimate the effect of market variables on the outcome, I examined total income, money borrowed and value of owned modern wealth in last 14 days. All the variables were entered individually in the regression.

(1) To define the income of the respondents I generated a variable for total income that incorporated the following questions:

a) Total earnings by subject in bolivianos from wage labor for last two weeks or last 14 days

b) Cash received as remittances in last 14 days

c) Total value of goods in bolivianos received by adult in barter in last 14 days

d) Total earnings in bolivianos by person from sale of goods in last 14 days

Tsimane’s personal income ranges from zero to 1850 bolivianos; on average Tsimane’ made 128 bolivianos during the last 14 days.

(2) The second market variable reflects total amount of money lent by the respondent to anybody for the last two months. The overwhelming majority of respondents (92.05%) had not given out money, and the rest lent from 5 to up to 1.800 bolivianos.

(3) The last variable reflected the value of selected modern physical assets owned by respondent: radios, watches, fishing nets, knives, bags, shotguns, cooking pots, machetes, mosquito nets, fishing hooks. On average Tsimane' owned 732.46 bolivianos in modern physical assets.

### ***Social Variables:***

Social variables refer to personnel behavior of Tsimane' and most importantly their acceptance and dependence on outside opinions and judgments. What makes people behave in the way they do behave? What brings emotional satisfaction or discontent? Is it their health, family members or peer pressure? These issues were kept in mind while designing the social variables.

(1) The first explanatory variable measured is the number of times a person got angry at members of the family in the last seven days. Because the variable has more than two categories, I created a dummy variable (often and sometimes = 1, never=0). The bivariate statistical results showed that 57% of the respondents were not angry at their family members, and about 33% were annoyed by their families during the last seven days.

(2) The second variable is health. 4.42% of respondents complained about their health, 44% reported that they were feeling okay and 51.69% of respondents said that they were in a good health state. In an econometric model I used a dummy variable for health (poor and ok = 1, good= 0).

(3) Finally, the third social variable refers to aspect of peer pressure, i.e. it reflects whether or not Tsimane' gossip, and if they do then how often. The information contains self-reported cases of being the target of rumors during the previous week. 21.94% of respondents reported that people were gossiping about them one time during the last week, and 57% replied that there were no occasions of people gossiping about them.

### ***11.2. Multivariate results***

In Table 2 I show the results of multivariate regressions to estimate the association between emotions (dependent variables) and (a) social and (b) market factors, along with several control variables described above.

Table 2 Multivariate results

<i>Explanatory variables</i>	<i>Dependent variables:</i>								
	<b>Anger</b>	<b>Fear</b>	<b>Stress</b>	<b>Happiness</b>	<b>Addiction</b>	<b>Sadness</b>	<b>Regret</b>		<b>Smile</b>
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<i>Market:</i>							(1)	(2)	
Income	-.0005	.0003	.0001	.00013	.00047*	7.70	.0023***	.0014***	-.0001
Credit given	0.002	-.0018	-.0001	-.0009	.00053	.0000	.0000	.0052***	.0011
Modern wealth	.0002	.0001	.0000	-.00004	-7.43	-.0008	.0010***	.0006***	4.38
<i>Social:</i>									
Anger at family member	2.26***	.644**	.088	-.2469	.1256	.627**	-.078	-.409**	.011
Health	-.292	.253	-.124*	.1384	.045	3.76	.135	-.985***	-.1407**
Gossip	.010	.219**	.010	.0743	-.0011	.3316***	.113	.381***	.0129
<i>Test of joint significance, F:</i>									
Market variables	1.73	1.27	2.90	0.99	2.29	0.07	12.39***	68.69***	5.63
Social variables	16.46***	7.62**	10.32*	0.85	1.16	12.47***	1.16	8329.1***	8.40*
Market=Social	20.81***	12.38**	0.13	0.01	2.30	16.46***	0.28	6.59*	2.70
<b>R2</b>	0.0877	0.0588	0.1137	0.0845	0.2998	0.0584	0.0985	0.3797	0.2361
<i>Observations</i>	593	593	593	593	593	593	591	592	593
<i>Regression type</i>	Tobit	Tobit	Probit	OLS	OLS	Tobit	Tobit	Tobit	Probit

*Notes. Regressions include the following covariates (not shown): education, age, sex, expenditures, food consumption, clothing, height, household size and dummy variables. Their detailed description is given in the Table 1. Tobits are lowered censored. Probit coefficients are probabilities estimated for marginal changes at mean values of explanatory variables. OLS=ordinary least squares; OLS include robust standard errors  $P < 0.10 = *$ ,  $P < 0.05 = **$ ,  $P < 0.01 = ***$*

### 1. Anger

The regression results with anger as an outcome variable (column 1) revealed that there is a significant positive relationship between social variables and anger ( $F=16.46$ :  $P=0.001$ ). For each additional episode of anger at a member of the family, the person's total episodes of anger at the rest of the world went up by 2.26 episodes ( $P=0.001$ ). The relationship of anger and total personal income is negative. For every 1,000 bolivianos increase in income there is a decrease in anger by 0.05 episodes. However, the regression did not reveal significant effects of income variables over anger.

Taken jointly, all social variables bore a statistically significant association with anger ( $F=16.46$ :  $P=0.001$ ). In contrast, none of the market variables individually or jointly ( $F=1.37$ :  $P=0.15$ ) bore a statistically significant association with anger. We test and

rejected the hypothesis that market and social variables had the same weight ( $F=20.81$ ;  $P=0.001$ ).

## 2. *Fear*

The second econometric model pointed at the positive significant connection between social variables and fear ( $F=7.62$ ;  $P<0.001$ ) and a low and insignificant association with the market variables ( $F=1.27$ ,  $P=0.285$ ). Every additional episode of anger at a family member during the previous week was associated with 0.64 more episodes of fear per week ( $P=0.002$ ). Interestingly, according to the model, every additional episode of perceived gossip by others was associated with 0.22 episodes increase of fear ( $P=0.003$ ), implying that for every additional five episodes of gossip against one, the subject reported one more episode of fear.

None of the market variables individually showed a statistically significant association with fear. However, social variables jointly exerted a stronger effect ( $F=7.62$ ;  $P=0.001$ ) than market variables ( $F=1.27$ ;  $P=0.28$ ) and an F test for the equality of the two vector of variables showed that they did not exert equal weight ( $F=12.38$ ;  $P=0.001$ ).

## 3. *Stress*

Only one of the six coefficients for which we expected positive association result showed statistical significance. There is a significant relationship between health variable and stress. A person with poor or average health was 12.4% less likely to report being stressed than a healthy person.

Market variables did not have a significant impact on stress variable, neither jointly or individually. The analysis of social variables as a group revealed a positive significant relationship with stress variable ( $F=10.32$ ,  $P=0.01$ ). Though, the comparative F test whether social variables had the same weight as market variables showed no difference ( $F=0.13$ ,  $P = 0.72$ ).

## 4. *Happiness*

There is no significant association between happiness and any of the explanatory variables. Even if we put aside the statistical significance of variables, the coefficients are very low. For example, there is a negative relationship between borrowing money and happiness that stands for Tsimane' being 0.09% less happy with every boliviano borrowed from them by their neighbors or relatives, however the change in the level of happiness is not considerable and is statistically insignificant ( $P=0.08$ ).

### 5. *Addiction*

Surprisingly none of social factors affect the attitude of interviewees to cigarettes or alcohol drinks. There is significant positive relationship between increasing income and increasing consumption of alcohol. i.e with every one boliviano increase in income there is 0.047 standard deviation increase in the Z score of addiction (P=0.03). However neither health nor quarrels in the family have significant relationship with alcohol and cigarette consumptions.

The F test of joint statistical significance revealed that neither social nor market variable bore statistically significant associations to alcohol and cigarettes consumption (Market: F=2.29, P=0.07; Social: F=1.16, P=0.3).

### 6. *Sadness*

The results of the regression model for sadness showed that every additional episode of anger at a family member accompanied by the 0.63 increase in episodes of sadness during a week (P=0.005). The study pointed out the statistically significant association between sadness and gossip. Thus, with every additional time the respondent's relatives talk poorly about the subject, the probability of being sad increases by 0.33 (P=0.001).

Social and market variables measured jointly and individually in the model rejected the initial hypothesis on their equal weight over sadness. The F test of joint statistical significance pointed out the significant association between sadness and social factors (F=12.47, P=0.001), namely whether person is sad depends on the social environment, such as family and peer pressure more than income or wealth (F=0.07; P=0.97).

### 7. *Regret (1)*

The regression result with regret over the purchase of durable goods as an outcome revealed positive significant association with increase in income and modern wealth. Thus, for every boliviano increase in income the person's regret over purchasing items goes up by 0.02 episodes (P=0.001). A one boliviano increase in the items of modern wealth is associated with 0.001 episodes in regret (P=0.001).

The results of F test of joint statistical significance of the social variables do not significantly affect people's regret over purchases (F=1.16, P=0.32), and there is a high association between regret and market factors (F=12.39, P=0.001). However, jointly both market and social variables have equal weight over regret (F=0.20, P=0.65).

### 8. *Regret 2*

The second regret variable showed a strong association with all explanatory variables. There is a significant relationship between market variables and regret:

1. Income: for every boliviano increase in income, the persons' regret at borrowing money increases by 0.0014 bolivianos (P=0.001).
2. Credit given: With every boliviano increase getting credit, a person's regret at borrowing money increases by .0052 episodes (P=0.001).
3. Modern Wealth: A one boliviano increase in the value of modern wealth augments regret variable by 0.0006 (P=0.001).

The social variables also have a significant association with regret.

1. Family: With every episode increase in anger at family members, there is a significant decreases in .person's regret at borrowing money of 0.409 episodes (P=0.01).
2. Health: With every episode decline in the health state, a person's regret at borrowing money decreases by 0.985 (P=0.001).
3. Gossip: With every episode increase in perceived gossip Tsimane' express 0.38 more episodes of regret there is a significant positive association between the variable gossip and regret. Thus with every episode increase in people's gossip, the individual's regret at borrowing money increases by 0.38 episodes (P=0.001).

The join F analysis showed that both market and social variables are significantly associated with regret over borrowing money. Though, the F value of social variables is significantly higher than the F value of market variables (F market = 58.69; F social =8329.08).

## 9. Smile

The assessment of social and market variables on people's smiles showed an interesting and unexpected result. There is no significant relation between the explanatory variables, except for the variable on health that is negatively correlated with our dependent variable. A person with poor or average health was 14.07% less likely to smile during the interview (P=0.008).

Jointly social variables bore a statistical significantly association with the smile variable (F=8.40, P=0.03) and little association with market variables (F=5.63, P=0.13). The F test on the weight of market versus social variables demonstrates their equal weight in the model (F=2.70; P=0.1).

### ***10.3. Robustness***

I did further analysis to ensure the robustness of the main results. The regressions in the Table 3 are identical to the regressions of Table 2 except for the changes noted in the sub-headings of Table 3. For the Table 3 I re-estimated the regression of the Table 2, columns 1, 4, and 8 and: (a) added the variable on the personal wealth rank in the village, (b) replaced income by the expenditures variable.

**Table 3**  
Robustness analysis

	<i>Dependent variables :</i>		
	<i>Anger</i>	<i>Happiness</i>	<i>Regret (2)</i>
	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>
<b>A. Controlling for personal wealth rank</b>			
<i>Explanatory variables</i>			
<i>Market</i>			
Income	-.001	-.004	-.001*
Credit Given	.002	-.001	.005***
Modern Wealth	.001	-.001	.001***
<i>Social</i>			
Anger at family member	-1.489***	-.226	.003
Health	.264	.128	.569***
Gossip	.037	.066	.306***
<b>Control variable</b>			
Personal wealth rank in the village	.015	.013*	.060***
<i>Test of Join significance</i>			
<i>Market variables</i>	2.30	1.58	2338.09***
<i>Social variables</i>	11.19***	0.70	1339.45***
<i>Market=Social</i>	9.27**	0.01	8.85**
R2	0.077	0.089	0.406
Observations	593	593	592
Regression type	Tobit	OLS	Tobit
<b>B. Expenditures for the last 2 weeks instead of the income for the last two weeks</b>			
<i>Explanatory variables</i>			
<i>Market</i>			
Expenditures	-.004	.003	.011***
Credit Given	.002	-.001	.006***
Modern Wealth	.001	-.001	.001***
<i>Social</i>			
Anger at family member	-1.468***	-.247	-.427***
Health	.255	.137	.412***
Gossip	.043	.071	.324***
<i>Test of Join significance</i>			
<i>Market variables</i>	1.22	1.10	180.66***
<i>Social variables</i>	10.86***	0.82	2974.44***
<i>Market=Social</i>	8.69**	0.02	0.99
R2	0.075	2.254	0.377
Observations	593	593	592
Regression type	Tobit	OLS	Tobit

Notes. Same as in Table 2

To ensure that the results are indeed driven by the chosen market and social factors, rather than the personal income I sorted the data on individual wealth rank in the village. In addition, I also aggregated the data on the individual total expenditures during the last 8 to 14 days. The robustness analysis was limited to three models, where the preference was given to model 1 (anger) and 8 (regret at borrowing money) due to their significant

association with the dependent variables; and to the model 4, due to the theory of the research, which treats happiness as a main component of subjective well-being.

a) Personal wealth rank in the village

(1) Adding the variable on personal wealth rank introduces minor changes into the results of the regression models. The result of column 1 shows that there is a significant association between anger and social variables and little and non-significant relation with the market variables. With every additional episode of anger at family member there is 1.48 fewer episodes of anger at the rest of the world. This result differs from the main outcome, where the possibility of individual anger increases by 0.26 episodes (Table 2). However, in Table 3 as well, the F test on statistical significance did not point at the equal importance of both factors, but showed the apparent significant association of social factors with anger.

(2) The inclusion of social rank as a control variable into the model with happiness has not changed the results either. None of the variables have significant effect on individual's happiness and the results are almost identical to values demonstrated in the Table 2.

(3) The insertion of the variable of personal wealth rank in the village brought the following changes. With every episode increase in health worsening, the expected episodes of regret at borrowing money increases by 0.57 episodes. On the contrary, with every episode increase in the health deterioration, there were expected 0.98 fewer episodes of regret at borrowing money in the Table 2. Values of other variables did not change.

The result of F test on joint statistical significance changes the coefficients of market and social factors (Market variables:  $F = 68.69$  in Table 2, and  $F = 2338.9$  in Table 3; Social variables:  $F = 8329.08$  in Table 2, and  $F = 1339.45$  in Table 3). Thus, the insertion of personal wealth rank into the model with regret as an outcome pointed out joint statistically significant affect of market variables on the regret at borrowing money ( $F=8.85$ ;  $P=0.003$ ).

b) Total expenditures during 8 to 14 days

The insertion of the independent variable 'total individual expenditures' reflects minor changes. In three models the values of F test on joint statistical significance remain almost the same. However, the association between anger and anger at family members

changed from a positive into a negative one. With every episode increase in anger at family member, the respondent's anger at the outside world decreases by 1.468 episodes. The change in the association of variables from positive (Table 2) into negative (Table 3) can be explained by the indirect affect of the variable expenditures. Namely, there is a significant negative correlation of variable expenditures with both dependent (anger) and independent (anger at family member) variables.

In model 3, every boliviano increase in expenditures is associated with expected increase by 0.11 episodes at borrowing money. The results of other variables in three models are almost identical to those in the Table 2. Further, the robustness analysis in Table 3 supports the main results of the evidence and analysis section.

## **11. Discussion**

This study has developed the mechanism to evaluate subjective/emotional well-being of individuals and contributed to understanding on how it can be affected by the market and social factors. The information is presented on the example of highly autarkic, small-scale society of forages and farmers in the Bolivian Amazon. Using variables health, anger at family members and peer pressure as a surrogate of social indicators, and total income, credit given and modern wealth as market indicators, I found that social factors are of greater importance for individual well-being than market ones. Some results of this study confirm the previous findings from industrial and developing nations, while others do not. However, because I came across only few quantitative studies on the subjective well-being using emotions as dependent variables, I find the comparison challenging.

### ***The role of families in the emotional well-being***

The comparison of the study with those done in industrial countries revealed some other commonalities. For example, Kusago mentioned the important role of good family relationship (Kusago, 2007, p.26). Though current study does not include exactly the same variable, I suggest that the variable anger at family members bears almost the same meaning. Here, I would highlight the significant association between sadness and the anger at family members ( $F=0.627$ ,  $P=0.005$ ), which tells that individuals' emotional state is affected by the interfamily relationships.

### ***Peer pressure and emotional well-being***

Drawing the analogy between peer pressure and well-being, the study revealed that people's gossip brings emotions of sadness and fear, and also make people rethink about

their actions in a negative way. The interpretation of the significance of the variable peer pressure in the econometric model stands for the importance of intercommunity relationship, and its influence on people's behavior. Moreover, "the individual orients himself or herself, normatively and/or comparatively, to various reference groups" and thus the "individual experiences some degree of socialization" (Lashbrook, 2000, <http://findarticles.com>).

### ***Health and psychological well-being***

The philosophers and psychologists emphasize on the strong association between health and well-being. Mulligan argues that the notions of well-being and health are very often used as the same concept and good health is connected to the physical, emotional and social well-being (2006, p.23). The current study found a negative association between health and emotions. However, only three models showed significant affect of health on the dependent variables (stress, regret and smile). Interestingly, the results pointed at no affect of bad health over happiness, fear or anger, which I would assume be key outcome of bad health. Results held up after introducing a number of changes in the control variables.

### ***The role of income in the subjective/emotional well-being***

Some of the results differ from the reviewed literature. For example, psychologist Mulligan mentioned that "material factors of income and wealth clearly remain important to well-being, and they take on varying levels of importance in the context of different national, communal and socio-economic situations" (Mulligan, 2006, p.23). Indeed, the income and wealth remain the main component of people's well-being. However, this study revealed the opposite results. I did not find significant connection between positive emotions and market factors, whereas there is a significant association between negative emotions (e.g. regret) and alcohol/cigarette addiction with the market indicators.

Finally, the findings of the study contradicted the main hypothesis on the equal weight of social and market factors in people's life. The main concern of Tsiamne' is related to social features, such as their health, family and intercommunity relationships, and only then income and wealth.

## **12. Conclusion and Recommendations**

Since the ancient times scholars of different fields has been examined subjective well-being and theory of emotions. Diener and others pointed to subjective well-being as "one

value among many, but one that is widespread because it allows people to judge their own values and standards” (Diener et al., 1998, p.36). Though, some researches and scholars underestimate the role and importance of social well-being, the others consider it as a main instrument of evaluation of individuals’ life. “Indeed, it is likely that subjective well-being is becoming increasingly central in a world where basic physical needs are met and greater respect is given to individuals” (Diener et al., 1998, p.36).

Paul Dolan (2006) referring to Day (1998) mentioned that to achieve successful development we need to build trust and confidence in the communities, but also to promote conversation between different social entities. “By promoting a bottom up approach to enhance different levels of the community, sustainable development would therefore embed change within the prevailing social and cultural resources of the rural population” (Dolan, 2006, p.15). Indeed, as we have seen from the findings of the current study, people do value family and intercommunity relationships, as well as they are strongly affected by the opinion of the surrounding people. Therefore, to ensure success of any development strategy and policy, it is important to embed social needs and requirements of societies.

Finally, the emphasis on the importance of social indicators does not reject the essential role of economic growth for the improvement of well-being, but underlines its vital coexistence with the social components of life. Therefore, referring to the findings of the study, I want to recommend incorporation of social needs assessment into the design and planning stage of the projects. I believe that the better needs assessment could lead to better acceptance of interventions among the recipients and thus lead to sustainable international development of communities.

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