Paper 6

The Danish Effect:

Beginning to explain high well-being in Denmark

Robert Biswas-Diener

Center for Applied Positive Psychology

Joar Vittersø

University of Tromsø, Norway

Ed Diener

University of Illinois and the Gallup Organization

Abstract

Although income and happiness have been linked at both the individual and national levels of analysis, few studies have specifically examined the different relationships between these two variables in affluent nations. This study investigates various measures of well-being in both the United States and Denmark. Respondents in both countries reported high levels of well-being but Americans generally reported greater positive and negative affect while Danes reported higher levels of satisfaction. Interestingly, low income respondents in the United States reported higher negative affect and lower life satisfaction than their counterparts in Denmark. For positive affect, the major difference between the two countries were found among high income respondents. The key to understanding differences in the well-being of these two nations appears to lie in understanding the well-being of the poor. Suggestions for future directions in research are discussed.

The Danish Effect: Beginning to explain high well-being in Denmark

People have long wondered about the connection between material goods and happiness. The question of whether or not money "buys happiness" has captivated the popular imagination since the dawn of civilization. Great thinkers from a variety of traditions ranging from philosophy to religion to economics have weighed in on the issue. Aristotle (1986/ 4th cent. BCE), for example, believed the good life was founded, in part, on meeting basic material needs. Jesus preached that it is more difficult for a rich man to get into the kingdom of God than for a camel to go through the eye of a needle (King James Bible, 1991). Karl Marx built his economic theory around the idea that material goods—and their equitable distribution in particular—were central to psychological quality of life (Marx, 1848/1988). Maslow (1954) also described basic material needs as a necessary precursor to well-being. In more recent times, experts have looked at the money-happiness link through an economic lens. The idea that being poor negatively affects well-being is at the heart of economic aid and intervention work (Sen, 1999). Similarly, Schor (1999) and Kasser (2003) both caution that hyper-consumerism and materialism can take a toll on happiness. It appears, then, that material goods, often thought of through proxy concepts like money or income, are linked with happiness in the popular mind.

There is, indeed, preliminary evidence that income and related material goods are associated with the well-being of individuals. In a recent review of the research literature addressing this topic Biswas-Diener (2008) reports that income is related to happiness at both low and high levels of individual income. Many studies have shown significant correlations between income and happiness for

specific groups of individuals including retired professors (Conner et al, 1985), homeless people (Biswas-Diener & Diener, 2006), villagers in India (Brinkerhoff et al.,1997), and the very wealthy (Diener et al, 1985). Although, in each instance, the correlations between income and subjective well-being are significant, they tend to be small. In a review of studies comparing correlations of SWB and income within nations, for example, Diener and Biswas-Diener (2002) found that the strength of the relationship generally ranged between .13 and .24. In addition, most of the research on this topic has been correlational, meaning that it is difficult to interpret causal direction or understand the effects of moderating variables or nuances such as income change. Even so, these studies as well as others like them, provide initial evidence that material needs play a role in subjective well-being.

There is also evidence that--at the national level—income and material goods are correlated with subjective well-being (Diener & Suh, 1999). In fact, correlations between these two variables at the country level tend to be much larger than those at the individual level of analysis. For example, Diener and colleagues (1995) examined the correlation between income related variables and measures of SWB across 55 nations. They found SWB correlates with GDP per capita (.58), purchasing power (.61), and the fulfillment of basic needs (.52). In a broad review of the research on income and happiness Diener and Biswas-Diener (2002) reported on correlations between mean income, as assessed by measures of Gross Domestic Product (GDP) and Purchasing Price Parity (PPP), and mean subjective well-being in a variety of previously published studies (e.g.s Diener & Oishi, 2000; Inglehart & Klingeman, 2000; Schyns, 2000; Veenhoven, 1991). Diener and Biswas-Diener found that the mean correlation between income and SWB at the national level was .60 across all the studies. This is similar to earlier findings by Inglehart and

Klingeman (2000) that the correlation between per capita income and mean SWB is .70 across countries. Thus income seems to be an important factor in the well-being of groups as well as individuals.

Differences in the happiness of wealthy nations

Interestingly, while many researchers have examined differences in SWB between rich and poor countries, few have looked at similar differences between wealthy nations. This may be because researchers have found a curvilinear relationship between income and well-being, suggesting a declining marginal utility of income on happiness (e.g. Inglehart & Klingeman, 2000). This does not necessarily mean, however, that there are no differences in happiness between wealthy individuals or wealthy nations and recent research results confirm that a closer examination is necessary. Diener and Oishi (2000), for example, found significant differences in life satisfaction between people in the top two income levels in an international college student survey as well as in the World Values Survey. More recently, an analysis of Gallup World Poll data by Diener and colleagues (submitted) reveals that GDP per capita is significantly correlated with the "Cantril ladder" (effectively a measure of current life satisfaction; .82), with the regression line being far straighter than it is curved. Diener and colleagues also found significant correlations across nations between income and domain satisfaction (.65), positive feelings (.42), and negative feelings (-.38). In fact, the authors also found significant differences in national happiness, even among the wealthiest nations. These new data suggest that there may be important differences in the happiness of people living in the richest nations, and that some of this variability is attributable to economic variables. Thus, it is important to look at

these differences because little is known about how societal differences at that top end of the income spectrum affect happiness.

Nowhere are "high income" national differences in well-being more conspicuous or interesting than in the case of Scandinavia. Scandinavian countries generally have many unique societal features. In international studies of well-being Scandinavian countries consistently report the highest levels of happiness (e.g. Diener & Suh, 1999; Veenhoven & Hagerty, 2003; Diener et al, submitted). Scandinavian countries are relatively wealthy (Economist, 2006), have the highest environmental sustainability indices (Economist, 2006), relatively ethnically homogeneous (Diener, Diener & Diener, 1995), relatively non-religious (Brown, 1993), have relative social equality (Hagerty, 2000), have relatively well-developed social programs such as maternity leave benefits (Haavind & Magnusson, 2005), and are disproportionately well-represented among Nobel Prize winners, by total population (Economist, 2006). These features, alone or in combination, could be candidate explanations for differences in subjective well-being between rich countries. Unfortunately, very little empirical research has been conducted to test these various hypotheses. One of the aims of this paper is to provide an initial examination of national differences in happiness between high income countries, testing many of these potential explanations for the high reports of well-being in Scandinavia.

Among the Scandinavian countries, Denmark is a particularly interesting case study in happiness. Denmark consistently ranks in the top three happiest nations in international surveys of well-being (e.g. Gallup World Survey, 2007; Inglehart & Klingeman, 2000; Diener, Diener, Diener, 1995). In fact, some evidence suggests that Denmark's average happiness has been rising for some time.

Veenhoven and Hagerty (2003), for instance, report that Denmark has shown a linear increase in happiness since 1974. In addition, Berntsson and Kohler (2001) report that several longitudinal measures of quality of life of children increased in Denmark from 1984 to 1996, despite the fact that subjective quality of life measures worsened for children in Norway and Sweden. What could account for the chronically high happiness in Denmark? Candidate explanations have included the social as well as the economic. Diener, Diener, and Diener (1995) report that, across samples, Denmark scores highly on measures of civil rights and individualism. Vogel (2002) reports that Denmark has low income inequality, low poverty, and high welfare expenditures relative to other countries. This paper will further examine possible causes for the unusually high rates of happiness in Denmark. In addition, we will consider the economic, social, and psychological quality of life in Denmark against the backdrop of the same variables in the United States. A direct comparison of two relatively affluent countries with differing levels of happiness will help provide new insights into the income-happiness relationship at the highest economic echelon.

Method

The data used in this study was collected in 2005 as part of a larger data set by the Gallup Organization in the first wave of their Gallup World Poll (2007). Gallup is an independent international polling organization headquartered in the United States. The Gallup World Poll was undertaken with the self-described aim of augmenting and improving upon existing international quality of life indices such as the United Nations Human development Index and economic indices such as Gross Domestic product (GDP). The hallmark features of the Gallup World Poll,

described in greater detail below, include broad, representative samples as well as "surveys of key indicators that range from basic survival requirements to feelings about general health, job satisfaction, financial security, personal enjoyment, and hopes for the future" (Gallup, 2007; p. 5).

The Gallup World Poll includes more than 200 items. Participants were asked a wide range of personal questions. These included queries about their demographic information, about the physical conditions of their lives including access to water and the Internet, about their work lives including the length of their daily commutes and their relationship with their supervisor, about their daily emotions, about their trust in local police and government, about their attitudes toward political issues such as the Israel-Palestine conflict, as well as about other things. The questions used a variety of answer formats including dichotomous answering (yes/no; true/false), Likert scale answers, and open ended answers (e.g. "how old are you?"). The Gallup World Poll used both telephone random digit dialing and in-person interview recruitment strategies. Care was taken to collect data from a broad, demographically representative sample in each nation.

In Denmark and the United States, the data for the Gallup World Poll was collected through telephone surveys. Participants were initially contacted by random digit dialing and were offered no compensation for participation. The refusal rate was approximately 75 per cent for Denmark and for the Untied States. Although these rates initially appear high, they are standard for telephone surveys in industrialized countries. In addition, the final samples were large (N = approx. 1,000) and nationally representative in terms of gender, age, number of children, and other demographic factors (see below).

Well-being Measures

We used a variety of measures of happiness in the current study. First, we used three items based on Cantril's (1965) Self-anchoring Striving Scale. In the first of these (which we subsequently refer to as the "life today" item) Gallup World Poll participants were asked to consider their lives as rungs on a ladder and gauge the quality of their lives on that ladder such that a score of 0 represents the "worst possible life" and a score of 10 represents the "best possible life." This item, effectively a proxy measure of life satisfaction, has the advantage of using individual and local standards for assessing quality of life. In a second, related item (subsequently referred to as "life in the past"), participants were asked to use the same 0 to 10 "ladder" to indicate how the quality of their lives "5 years ago." If one assumes, as prior research suggests (see Diener & Biswas-Diener, 2008; Balatsky & Diener, 1993), that temperamentally positive people can more easily recall positive events or are more likely to mis-remember past events as more positive than they actually were then this question can be viewed as tapping positivity, regardless of the actual conditions of the past. In the third and final "ladder" question (subsequently referred to as "life in the future") respondents were asked to make a guess about the conditions of their lives five years in the future. Again, while this question is not a direct measure of "happiness" it does reflect optimism which is, in turn, highly correlated with subjective well-being (Snyder, 2000). Taken together, the three items also form a kind of well-being timeline, in which we can assess trends in perceived quality of life as generally getting better or worse.

In addition to the three ladder items, described above, the Gallup World Poll also included a number of questions related to the experience of positive and

negative affect. In each case, respondents were asked whether or not they experienced any of the following during the day prior to the data collection: worry, sadness, anger, shame, depression, enjoyment, smiling, proud, learn and love. These items were answered on a dichotomous "yes/no" basis.

Well-being indices

To examine the possibility that national differences in happiness might be attributable to differences in societal make-up we analyzed social capital related variables. To examine community factors such as trust and social capital we analyzed the "Law and Order Index" included in the Gallup World Poll. This index "represents security levels that respondents report for themselves and their families (Gallup, 2007, p. 23). The index was created using the following items: A) In the city or area where you live, do you have confidence in the local police force, or not? B) Do you feel safe walking alone at night in the city or area where you live? C) In the last 12 months, have you had money or property stolen from you or another household member? The Law and Order Index shows good reliability, with a Gallup World Poll-wide Cronbach's Alpha of .77 (Gallup, 2007).

Data analyses

SPSS 15.0 for Windows was applied for descriptive, bivariate and multiple regression analyses. WINMIRA 3.2 (von Davier, 2000) was applied for the item response modeling and Mplus 5.0 (Muthén & Muthén, 1998 – 2007) was applied for the comparisons of factor structures across countries.

Results

Before conducting an in-depth analysis of the data we examined the basic demographic composition of our two samples to ensure that they were comparable. The results can be seen in Table 1. As can be seen the samples did not differ by gender or age. They did, however, differ by marital status, educational status, and overall household income. Subsequent analyses of these variables revealed that neither marital nor educational status was significantly associated with our happiness related outcome variables. As can be seen in Table 1, the American sample reported significantly higher income, with a far greater standard deviation suggesting a wider distribution of income in the US than in Denmark. Income, as it relates to well-being, will be discussed in greater depth below.

----------Table 1 about here---------

Differences in well-being: affect

Table 2 provides means and standard deviations for the 10 affect items included in the Gallup World Poll. There is no significant mean difference for smiling between the two countries, but Danes in the current study express more enjoyment and less love, pride and learning compared with participants from the US. Respondents from the USA report higher levels of worry, sadness, anger and depression than their Danish counterparts. There were no statistical differences between the two samples for shame.

----------Table 2 about here---------

Even if there are significant means differenced between the two countries, we cannot be certain whether these reflect true differences in affect or differences in cultural biases in responding to the questions (van de Vijver & Poortinga, 1997).

To investigate the possibility that the affect items are differently interpreted by our two samples (i.e., response biases), we carried out a three steps procedure to test for scale invariance (Cheung & Rensvold, 1999).

First, the construct (or form) invariance was tested and confirmed and the factor structure is depicted in Figure 1. The modified model with a correlated error term between "learning" and "proud" significantly improved the model fit, from χ^2 (34, N = 2005) = 286.42, $p < .001$, CFI = .89, RMSEA = .06, for a model without correlated errors, to χ^2 (33, N = 2005) = 142.00, $p < .001$, CFI = .95, RMSEA = .04, for a model with correlated errors. Both the Danish sub-sample and the sub-sample from the US achieved acceptable goodness-of-fit with χ^2 (33, N = 1004) = 88.27, $p < .001$, CFI = .92, RMSEA = .04 for the Danes and χ^2 (33, N = 1001) = 99.56, $p < .001$, CFI = .96, RMSEA = .05, for the Americans. To account for the dichotomous scoring of these items, we also ran the factor analysis with polychoric correlations, and got the following goodness of fit measures for the Danish sample: χ^2 (28, N = 1004) = 56.25, $p < .001$, CFI = .94, RMSEA = .04 and for the US sample: χ^2 (25, N = 1001) = 45.19, $p = .008$, CFI = .99, RMSEA = .03.[1)]

----------Figure 1 about here---------

After construct equivalence has been established, the next step is to test for invariance among the factor loadings, referred to as measurement (or metric) invariance. Table 3 shows the factor loading for Denmark and the US for both Pearson's correlations (assuming data at interval level), and for polychoric correlations (assuming data at ordinal or dichotomous levels). Table 4 shows the goodness-of-fit comparisons between the two countries.

----------Tables 3 and 4 about here---------

The final step in testing for invariance, is to investigate full score (or scalar) invariance, which concerns differences in intercepts. This test only makes sense if the factor loadings are established as invariant, hence for our data only the items "love," "learning," "worry," "sadness," "anger" and "shame" were tested. As revealed in Table 4, only the item "shame" sustained full invariance in these data, and we must, therefore, conclude that the affect items cannot be directly compared across the two nations.

Item response models

In an attempt to remedy the situation, the affect items were fitted to a Mixed Rasch Model (e.g., Embretson & Reise, 2000). The Mixed Rash Model does not assume a homogenous response pattern across participants in a population, and it enables the transformation of a set of dichotomous item scores into a single comparison scale with equal zero-points and similar metric (Bond & Fox, 2001). Bootstrapped p-values for Pearson's chi-square and Cressie Read was used to evaluate the goodness-of-fit for our models. Separate models were fitted for positive and negative affect items, and we increased the number of latent classes until the p-values for Pearson's chi-square and Cressie Read were above .05. For the positive affects, three latent classes were needed to reach acceptable fit while a model with two latent classes fitted the five negative items. The different response patterns for the positive affect model are presented in Figure 2.

---------- Insert Figure 2 about here---------

For the positive affects, the thresholds for the five items in class 1 (which comprises 40% of the total sample) have relatively stable threshold at a latent trait level of approximately 2. The single exception is "enjoyment," which has a threshold of approximately -7. Members of this class have a higher probability of

endorsing the positive affect items when their latent level of positive affect exceeds approximately 2, except for "enjoyment," for which item the members have a higher probability to agree at a much lower level of positive affect (namely around -7). Members of class 2 (comprising 37% of the sample) are characterized by a high probability of endorsing the first three items, and lower probability of endorsing the last two items, whereas class 3 (comprising 23% of the total sample) have a relatively stable threshold pattern around 0. They do not, in other words, discriminate much between the items.

Turning to the negative affects, the members of class 1 (forming 69% of the total sample) are likely to be worrisome and angry, and less likely to be sad or depressed. Members of this class tend to be in the medium range of shamefulness. Class 2 (forming 31% of the total sample) are likely to endorse the "worry" and "sadness" items, moderately likely to endorse the "anger" and "depression" items, and not very likely to endorse the "shame" item (cf. Figure 3).

---------- Insert Figure 3 about here---------

Next, we tested cultural differences in class membership. For positive affect, a chi-square test reveled cultural differences in class membership (χ^2 [2, N = 1885] = 110.61, $p < .001$), with a relatively larger proportion of the Danish sample represented in class 1 (48.5% of the Danes versus 25.2% of the Americans), and with relatively more Americans in class 2 (56.2 of the Americans versus 39.3% of the Danish). Class 3 comprises 18.6% of the American sample and 12.2% of the Danish sample.

We also found cultural differences in class membership for negative affect (χ^2 [1, N = 1895] = 47.98, $p < .001$), with a relatively larger proportion of the Danish sample represented in class 1 (86.3% of the Danes versus 73.9% of the

Americans), relatively more Americans in class 2 (26.1% of the Americans versus 13.7% of the Danish).

The Mixed Rasch Model provides estimates of each participant's trait parameter, which adjusts the scores for item bias (Bond & Fox, 2001). Hence a comparison of the trait parameter means for the Danish and American samples, gives a better indication of the unbiased differences in positive affect between the two country samples. The upper rows of Table 5 give the statistics from a t-test comparing both trait parameter and an ordinary mean score variable for the five positive affect items. As can be seen, the differences between USA and Denmark are reduced when the parameters are compared, but Americans are still reporting higher levels of positive affect than the Danes. Table 5 also shows the affect balance (positive minus negative affect) for each nation, revealing American respondents to have significantly less positive affect balance than their Danish counterparts. In other words, if affective well-being is considered as a balance between positive and negative affect, the higher levels of negative affect in the US sample seem to outweigh the higher level of positive affect among Americans.

----------Table 5 about here---------

Affect and income across nations

To investigate the relation between income and affect, two multiple regression analyses were conducted, each with a moderator variable. In the first analysis, the positive affect trait parameter was included as the dependent variable, whereas income (centered), country, the interaction between income (centered) and country, education and marital status were entered as factors. As presented in Table 6, there is a significant interaction between income and nation on positive affect,

and after this effect is accounted for, the higher level of positive affect among Americans are no longer significant. The nature of the interaction is graphically depicted in Figure 4a, showing that rich Americans report more positive affects than rich Danes.

The results from the equivalent analysis using the negative affect trait parameter as the dependent variable are presented in Table 6, again showing that the relation between income and affect is significantly stronger in the USA than in Denmark. However, for negative affect the biggest difference appears between the poorer participants (Figure 4b).

--------Table 6 and Figure 4 about here-------

Cantril's ladder

The three versions of Cantril's ladder (the "life today," "life in the past," and "life in the future" items, respectively) had a correlation pattern that was inconsistent with a one-factor model in both the American and the Danish sub-samples. This is because the product of the two highest correlations was higher than the lowest correlation in the correlation matrix (E. Røysamb, personal communication, 28. September 2008). Hence these items were treated separately. As can be seen in Table 7 respondents in both countries generally reported high levels of satisfaction with the past, present, and future, where participants in Denmark reported higher levels than those in the US. A t-test revealed that all mean differences were significant at the $p < .001$ level. It is worth noting that for people in both nations there was a sense of greater satisfaction with the present than the past, and an optimistic feeling toward the future.

---------Table 7 about here--------

A series of three multiple regression analyses with income, nation, the interaction between income (centered) and nation, education and marital status were conducted with the Cantril "life today," "life in the past" and "life in the future" items as dependent variables, respectively. There is an effect of income on "life today" and "life in the future," but not on "life in the past." Moreover, the Danish sample yielded higher scores compared with the American sample on all three satisfaction variables, while we only found an interaction effect between nation and income for the "life today" variable. Education has no effect on the satisfaction variables, but there is a small tendency that married individuals report slightly less satisfaction in the future. Please refer to Table 8 and Figure 5 for further details.

--------Table 8 and Figure 5 about here-------

Law & Order Index

The means for the Law & Order Index was relatively high for both nations, but higher for Denmark (M = 0.87, SD = .17) than for the USA (M = .87, SD = 0.20). A subsequent t-test revealed these means to be significantly different from one another (t [2003] = -3.23, $p < .001$). To further investigate the social capital variable, the Law & Order variables was split by it's median into a low L&O group and a high L&O group. Then, a series of a 2 (USA vs. Denmark) by 2 (Low L&O vs. High L&O) analysis of variance (ANOVA) was performed with the three Cantril's ladder items, and the positive affect scale and the negative affect scale as dependent variables. Significant main effects were found in all five analyses (all p's < .001, except for positive affect for which p = .017 for the country means). We also found significant interaction effect for the Cantril today variable ($p < .001$), the

negative affect variable (p = .001) and the positive affect variable (p = .02). In all three analyses, the effect of Law & Order on current quality of life, negative affect and positive effect was stronger in the USA than in Denmark. The group means and inferential statistics are reported in Table 9.

We also included the Law & Order variable as a covariate in the multiple regression analyses reported tables 6 and 8 above, but the inclusion of this variable made only trivial changes in the results. In other words, American poor are still unhappy relative to their counterparts in Denmark, even after controlling for their lower levels of law and order.

---------Table 9 about here--------

Discussion

Overall, respondents in both the United States and Denmark report high levels of well-being. This is consistent with the findings that "most people are happy" (Biswas-Diener, Vitterso & Diener, 2005) as well as with past international research on happiness (Diener & Biswas-Diener, 2002). Many researchers have found, for example, that people in Western industrialized nations benefit from the relatively positive attitudes toward democracy, the good infrastructure, and personal freedoms common to those places (Diener & Diener, 1995; Veenhoven, 1993). The current study replicated these past findings and we can reasonably assume that factors found in prior research such as the material wealth, relative peace, and individuals freedoms in these nations, are generally implicated in the high degree of well-being reported in these two countries.

Unfortunately, many past surveys on this topic have relied on only a single measure of well-being, often asking participants how "happy" or "satisfied" they

are. The current research improves on some past international survey research by employing multiple items to measure well-being; most notably including both cognitive (e.g. "life today") and affective (e.g. "shame") items. This allows us to examine possible differences in types of well-being. Diener and colleagues (submitted) have argued that satisfaction measures in general, and the Cantril items contained in the Gallup World Poll specifically, are broad "stand back" evaluative measures and are, therefore, more susceptible to income and other material circumstances. If this is true then we might predict that Danes, with their greater income equality, would show higher scores on Cantril items whereas Americans, with a greater income distribution, might have lower rates of satisfaction because low income respondents would drag down the overall average. In fact, we found that Danish respondents reported significantly more positive evaluations of their own lives in the past, present and future. This is consistent with a number of international surveys in which Denmark routinely outranks the US on life satisfaction (e.g. Diener, Diener & Diener, 1995). Interestingly, we found a significant income by nation interaction effect for evaluations of "life today." This means that, while respondents in Denmark generally have more positive evaluations of their lives, this difference is particularly pronounced for people with relatively low income. Thus, because Denmark has such high income equality relative to the United States, it appears that the difference in overall happiness between these two nations can be partially explained by the relatively lower satisfaction of low income respondents in the United States. Put simply, Denmark's success as being the "happiest country in the world"— can be attributed, in part, to the relatively high satisfaction of its poorest, rather than its richest, citizens. We

call this ability to psychologically care for citizens at every income level the "Danish Effect."

Although Danes consistently report higher levels of satisfaction than their American counterparts, it is interesting to consider the affective component of well-being as well. Where Danish respondents reported higher levels of satisfaction, members of the American sample reported significantly more positive and negative affect. Thus, while it might be true that Denmark consistently ranks highly on the cognitive dimensions of happiness (i.e. life satisfaction) the current study suggests that Americans are more "emotional" and report higher levels of positive affect than the Danes. Thus, it is possible that international surveys reporting only life satisfaction data are misleading regarding a more complete picture of the well-being of nations. Past research has documented cultural norms for high arousal positive emotions and an emotional "positivity bias" in American and other samples (Tsai, 2008: Diener et al., 2000). It could be that international surveys that do not include affect items miss an important element of well-being. It is also possible that affect balance may help explain the satisfaction findings for each nation. Specifically, our results suggest that the relatively high negative affect scores for Americans in this study outweigh the benefits of their relatively high positive affect.

What's more, when we examined affective dimensions of well-being more closely across our samples we found a significant income by nation interaction for both positive and negative affect. This means that affluent members of the American sample were significantly higher on positive affect than their privileged counterparts in Denmark, and low income Americans were significantly higher in negative affect than their counterparts in Denmark. Taken together, a pattern

emerges that is similar to our "Cantril item" results: the low income Danes appear to experience well-being on par with the high income Danes while low income Americans appear to suffer more negative affect and benefit from less positive affect. Once again, the key to understanding difference in the well-being of these two affluent nations seems to lay in their difference income distributions; in particular, in understanding the psychological consequences of being poor in a high income disparity nation such as the United States.

It is possible that some societal factor accounts for the lower well-being of poor citizens in the US, and that this same factor is better addressed in Danish society thereby buffering the Danish poor against adverse psychological consequences. To examine this hypothesis we used the Law & Order Index, because income has been associated with security and trust concerns (Tov & Diener, 2008). We found that respondents from Denmark reported higher rates of endorsement of perceived law and order, and that law and order was significantly linked to both cognitive and affective well-being in both nations. When we examined the well-being of the poor controlling for local perceptions of law and order, however, we found that law and order, alone, could not account for the lower well-being scores of the American poor. Further research must be undertaken to better investigate possible psychological burdens or benefits of being poor in the US and Denmark, respectively. It is possible that social comparison or unique societal aspirations adversely affects poorer Americans. Further study on this topic is needed.

There were many strengths in the current study. First, our data was drawn from large, representative samples allowing us to generalize our findings. We also employed item response models to account for cultural differences in responding to

the well-being measures, adding further confidence to the accuracy of our results and conclusions. Finally, we analyzed both cognitive and affective aspects of well-being, allowing us a more in-depth look at the structure of well-being across nations. Our study contained a number of limitations as well. For instance, there was a relatively low response rate to the telephone survey and—although the response rate in the current study was comparable to telephone surveys—we cannot entirely rule out the possibility of selection bias in our samples. We feel, given the size of the samples and the commonplace nature of telephones in the countries of interest, that this limitation is minor. In addition, our data represent only self-report measures reflecting a single sampling. As such, we recognize the possibility that response biases and environmental factors could affect the data. Where possible, we have attempted to use item response analyses and multiple measures of well-being to mitigate the risk of such effects. Finally, because we only analyzed data from two nations we cannot be sure how the present findings generalize to other affluent nations, in Scandinavia or elsewhere.

We conclude by pointing to the importance of the current research. Understanding the well-being of affluent nations, and how each wealthy nation may differ from one another, is essential to creating better social, environmental, health care, and economic policy. In the current study we found that the lower average well-being of American respondents is explained primarily by the relatively low well-being of the poor in that country. This means that policy makers and others concerned with social intervention in the United States might focus on programs and policies aimed at the poor and that policy makers everywhere might look to the Danish example to better understand why the "Danish Effect" works.

Endnote

1) The degrees of freedom cannot be unambiguously determined for a model with polychoric correlations, and the chi-square values cannot be used to test differences between models.

References

Argyle, M. (2001). *The psychology of happiness, 2nd Ed.* New York, NY: Routledge.

Aristotle (1986/4th Cent. BCE). *Nichomachean Ethics*. New York: Macmillan.

Balatsky G. & Diener E. (1993). Subjective well-being among Russian students. *Social Indicators Research, 28,* 225–243.

Berntsson, X & Kohler, X. (2001). Quality of life among children aged 2-17 years in the five Nordic countries: Comparison between 1984 and 1996. *European journal of public health, 11,* 437-445.

Biswas-Diener, R. (2008). Material wealth and subjective well-being. In Eid, M. & Larsen, R. (Eds). The science of subjective well-being. (pp. 307-322). New York, NY, US: Guilford Press.

Biswas-Diener, R., & Diener, E. (2006). Subjective well-being of the homeless, and related lessons for happiness. *Social Indicators Research, 76,* 185-205.

Biswas-Diener, R. & Diener, E. (2001). Making the best of a bad situation: Satisfaction in the slums of Calcutta. *Social Indicators Research, 55*, 329-352.

Biswas-Diener, R., Vitterso, J. & Diener, E. (2005). Most people are pretty happy, but there is cultural variation: The Inughuit, the Amish, and the Maasai. *Journal of Happiness Studies, 6,* 205-226.

Bond, T. G., & Fox, C. M. (2001). *Applying the Rash model: Fundamental measurement in the human sciences.* Mathwah, NJ: Lawrence Erlbaum.

Brinkerhoff, M. B., Fredell, K. A., & Frideres, J. S. (1997). Basic minimum needs, quality of life and selected correlates: Exploration in villages in northern India. *Social Indicators Research, 42,* 245-281.

Brown, L.B. (1993). The psychology of religion in Scandinavia. *International Journal for the Psychology of Religion, 3,* 47-67.

Cantril, H. (1965). *The pattern of human concern.* Brunswick, New Jersey: Rutgers University Press.

Cheung, M. W. L., & Rensvold, R. B. (1999). Testing factorial invariance across groups: A reconseptualization and proposed new method. *Journal of Management, 25,* 1-27.

Conner, K. A. Dorfman, L. T. & Tompkins, J. B. (1985). Life satisfaction of retired professors: The contribution of work, health, income, and length of retirement. *Educational Gerontology, 11,* 337-347.

Diener, E. (2000). Subjective well-being: The science of happiness, and a proposal for a national index. *American Psychologist, 55*, 34-43

Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*, 542-575.

Diener, E. & Biswas-Diener, R. (2008). Happiness: Unlocking the mysteries of psychological wealth. Boston, MA: Blackwell.

Diener, E., & Biswas-Diener, R. (2002). Will money increase subjective well-being?: A literature review and guide to needed research. *Social Indicators Research, 57,* 119-169

Diener, E., & Diener, C. (1996). Most people are happy. *Psychological Science, 7,* 181-185.

Diener, E. & Oishi, S. (2000). Are Scandinavians happier than Asians? Issues in comparing nations on subjective well-being. In. Columbus, F. (Ed.), *Politics and economics of Asia*. Hauppauge, NY: Nova Science Publishers.

Diener, E. & Suh, E. M. (1999). Measuring subjective well-being to compare quality of life of cultures. In Diener, E. & Suh, E. M. (Eds), *Culture and subjective well-being.* Boston, MA: MIT Press.

Diener, E., Diener, M., & Diener, C. (1995). Factors predicting the subjective well-being of nations. *Journal of Personality & Social Psychology, 69,* 851-864

Diener, E., Horwitz, J., & Emmons, R. A. (1985). Happiness of the very wealthy. *Social Indicators Research,16,* 263-274.

Diener, E., Ng, W., Harter, J. & Araroa, R. (submitted). Wanting, liking, and other reasons money might be associated with happiness: The First survey of Planet Earth.

Diener, E., Napa-Scollon, C. K., Oishi, S., Dzokoto, V., & Suh, E. M. (2000). Positivity and the construction of life satisfaction judgments: Global happiness is not the sum of its parts. *Journal of Happiness Studies, 1,* 159-176.

Economist (2006). *Pocket world in figures.* London: Profile Books Ltd.

Embretson, S. E., & Reise, S. P. (2000). *Item Response Theory for psychologists.* London: Lawrence Erlbaum Ass.

Gallup (2007). *The state of global well-being.* New York: Gallup Press.

Haavind, H. & Magnusson, E. (2005). The Nordic countries – Welfare paradises for women and children? *Feminism & Psychology: An International Journal, 15,* 229-237.

Hagerty, M. R. (2000). Social comparisons of income in one's community: Evidence from national surveys of income and happiness. *Journal of Personality & Social Psychology, 78,* 764-771.

Inglehart, R., & Klingemann, H. D. (2000). Genes, culture, and happiness. In E. Diener & E.M. Suh (eds.), *Subjective Well-being across Cultures* (MIT Press, Cambridge, MA).

Kasser, T. (2003). The high price of materialism. Cambridge, MA: MIT Press.

King James Bible. (1991). New York: Ivy Books.

Marx, C. (1848/1988). *The communist manifesto.* New York: WW Norton & Co.

Maslow, A.H. (1968). Toward a psychology of being, 2nd Ed. New York, NY: D. Van Nostrand Company.

Muthén, L. K., & Muthén, B. O. (1998 - 2007). *Mplus user's guide.* (Fifth Edition ed.). Los Angeles, CA: Muthén & Muthén.

Schor, J. B. (1999). *The overspent American: Why we want what we don't need.* New York: Harper.

Schyns, P. (2000). The relationship between income, changes in income and life satisfaction in West Germany and the Russian Federation: Relative, absolute, or a

combination of both? In E. Diener and D.R. Rahtz (eds.), *Advances in Quality of Life Theory and Research, Volume 1* (Kluwer, Dordrecht, Netherlands, (83-109).

Sen, A. (1999). *Development as freedom.* New York: Random House.

Snyder, C. R. (2000). *Handbook of hope: Theory, measures, and applications.* San Diego, CA: Academic Press.

Tov, W. & Diener, E. (2008). The well-being of nations: Linking together trust, cooperation, and democracy. In Sullivan, B. A, Snyder, M. & Sullivan, J. L. (Eds). *Cooperation: The political psychology of effective human interaction.* (323-342).

Tsai, J. (2008). Ideal affect: Cultural causes and behavioral consequences. *Perspectives on Psychological Science, 2*, 242-259.

Vogel, J. (2002). Welfare production, poverty and wealth: A comparative and longitudinal perspective. In Glatzer, W. (Ed), *Rich and poor: disparities, perceptions, concomitants* (235-270). Dordrecht: Kluwer Academic Publishers.

von Davier, M. (2000). WINMIRA 32 User Manual. Kiel, Germany: IPN - Institute for Science Education.

van de Vijver, F. J. R; Poortinga, Y. H. (1997). Towards an integrated analysis of bias in cross-cultural assessment. *European Journal of Psychological Assessment. 13*, 29-37.

Veenhoven, R. (2005). Is life getting better? How long and happily do people live in modern society? *European Psychologist, 10*, 330-343.

Veenhoven, R. 1993, Happiness in Nations: Subjective Appreciation of Life in 55 Nations 1996-1990 (RISBO, Rotterdam).

Veenhoven, R. (1991). Is happiness relative? *Social Indicators Research,24*, 1-34.

Veenhoven, R. & Hagerty, M. (2003). Rising Happiness in Nations 1946-2004 A reply to Easterlin. *Social Indicators Research, 79,* 421-436

Table 1

Demographic Make-up of Samples

	N	Men	Women	Married	Single	Divorced	Widowed	Age (SD)	Edu	Income
USA	1001	424	577	570	171	131	88	51.25 (17.70)	86.00	58 644.05 (43,443)
Denmark	1004	440	564	550	194	41	110	48.50 (17.00)	67.20	32 401.58 (13,816)

Note. Edu = Percentage of sample with secondary or higher education; Income = Mean household income

Table 2

Mean Scores and Standard Deviations (SD) for Denmark and USA

(N = 971 to 1001 within each group)

Affect	Nation	Mean	SD
Smile	USA	0.78	0.41
	Denmark	0.78	0.41
Enjoyment***	USA	0.85	0.36
	Denmark	0.91	0.29
Love*	USA	0.93	0.26
	Denmark	0.90	0.30
Proud***	USA	0.77	0.42
	Denmark	0.51	0.50
Learn***	USA	0.66	0.47
	Denmark	0.59	0.49
Worry***	USA	0.34	0.47
	Denmark	0.22	0.41
Sadness***	USA	0.22	0.41
	Denmark	0.13	0.34
Anger***	USA	0.19	0.39
	Denmark	0.12	0.33
Shame	USA	0.04	0.18
	Denmark	0.03	0.18
Depressed***	USA	0.14	0.35
	Denmark	0.03	0.17

Note. * = $p < .05$, *** $p < .001$.

Table 3

Factor Loadings, Correlations and Intercepts for Denmark (N = 1004) and USA (N = 1001) Based on Pearson and Polychoric Correlations

	Denmark						USA					
	Continuous			Categorical			Continuous			Categorical		
	FL	r	Int	FL	r	Int	FL	r	Int	FL	r	Int
Smile***	0.56		1.84	0.83		-0.77	0.71		1.9	0.87		-0.78
Enjoy**	0.49		3.18	0.78		-1.34	0.67		2.39	0.86		-1.04
Love[1)]	0.27		3.3	0.41		-1.3	0.38		3.56	0.67		-1.45
Proud**	0.15		1.01	0.17		-0.02	0.42		1.84	0.55		-0.75
Learn	0.27		1.2	0.33		-0.23	0.36		1.4	0.45		-0.42
Learn vs Proud***		0.32			0.5			0.18			0.34	
Worry[2)]	0.47		0.53	0.64		0.79	0.58		0.71	0.76		0.46
Sadness[2)]	0.72		0.38	0.92		1.13	0.64		0.52	0.8		0.79
Anger[2)]	0.38		0.38	0.57		1.16	0.44		0.49	0.59		0.87
Shame	0.18		0.18	0.44		1.86	0.38		0.19	0.7		1.18
Depressed***	0.38		0.18	0.71		1.88	0.71		0.4	0.95		1.09
POAF vs NEAF***		-0.43			-0.45			-0.62			-0.65	

Note. FL = Factor loading; Int = Intercept; r = correlation; ** = Difference between continuous Factor loadings in Denmark and USA at $p < .01$; *** = Difference between continuous Factor loadings (and correlations) in Denmark and USA at $p < .001$; [1)] = intercepts different at $p < .05$ for continuous model; [2)] = intercepts different at $p < .001$ for continuous model.

Table 4

Chi-square Differences in Factor Structure for Denmark (N = 1004) and USA (N = 1001)

CONSTRAINTS	item	χ^2	DF	$\Delta\chi^2$	Δ DF	p
None		187.82	66			
All		519.61	82	331.79	16	0.000
Factor loadings for	smile	212.44	67	24.62	1	0.000
Factor loadings for	enjoy	195.37	67	7.55	1	0.006
Factor loadings for	love	188.62	67	0.80	1	0.372
Factor loadings for	proud	198.16	67	10.33	1	0.001
Factor loadings for	learn	188.99	67	1.17	1	0.280
Factor loadings for	worry	189.13	67	1.30	1	0.254
Factor loadings for	sadness	191.41	67	3.58	1	0.058
Factor loadings for	anger	187.83	67	0.01	1	0.924
Factor loadings for	shame	191.10	67	3.28	1	0.070
Factor loadings for	depressed	228.22	67	40.39	1	0.000
corr Proud vs Learn		206.94	67	19.12	1	0.000
corr POAF vs NEAF		206.40	67	18.57	1	0.000
Intercepts for	love	191.87	67	4.04	1	0.044
Intercepts for	learn	199.10	67	11.27	1	0.001
Intercepts for	worry	223.03	67	35.21	1	0.000
Intercepts for	sadness	214.13	67	26.30	1	0.000
Intercepts for	anger	205.68	67	17.85	1	0.000
Intercepts for	shame	187.98	67	0.16	1	0.692

Note. Corr Proud vs Learn = correlation between error terms for Proud and Learn; corr POAF vs NEAF = correlation between the positive affect factor and the negative affect factor.

Table 5

Mean Difference for Mean Scores and Trait Parameters between Denmark and USA for Positive Affect and Negative Affect.

	Nation	N	Mean	SD	t-value	p value
POAF mean	USA	980	0.80	0.25	4.91	< .001
	Denmark	905	0.75	0.23		
POAF par	USA	980	2.82	1.94	2.68	= .008
	Denmark	905	2.57	2.07		
NEAF mean	USA	997	0.18	0.25	8.01	< .001
	Denmark	988	0.11	0.18		
NEAF par	USA	997	-2.28	1.71	7.80	< .001
	Denmark	988	-2.81	1.29		
AFBAL	USA	997	0.62	0.41	-1.43	= .148
	Denmark	988	0.64	0.30		
AFBAL par	USA	997	5.10	3.00	-2.23	= .025
	Denmark	988	5.39	2.56		

Note. POAF mean = mean score for the 5 positive affect items; POAF par = Trait parameter for the five positive affect items; NEAF mean = mean score for the 5 negative affect items; NEAF par = Trait parameter for the five negative affect items; AFBAL = Positive affect minus negative affect; AFBALpar = POAF par minus NEAF par.

Table 6

Multiple Regression Analysis of Affect Against Income, Nation, Marital Status and Education

	POAF				NEAF			
	B	SE	Beta	p	B	SE	Beta	p
Intercept	3.13	0.25		.000	-2.40	0.18		.000
Income	0.44	0.07	.22	.000	-0.36	0.05	-.23	.000
Nation (0 = USA)	-0.11	0.10	-.03	.302	-0.64	0.08	-.21	.000
Income*Nation	-0.25	0.10	-.08	.013	0.33	0.08	.14	.000
Married (0 = no)	-0.03	0.03	-.02	.381	-0.01	0.02	-.02	.509
Education	-0.07	0.05	-.04	.166	0.06	0.04	.04	.137

Note. N = 1575 for positive affect and N = 1647 for negative affect.

Table 7

Mean Scores, Standard Deviations (SD), and t-values for Cantril's Ladder in USA and Denmark

	Nation	N	Mean	SD	t-value	p value
Life today	USA	995	7.26	1.89	-10.01	< .001
	Denmark	998	8.00	1.35		
Life 5 years ago	USA	996	6.45	2.33	-9.33	< .001
	Denmark	989	7.34	1.89		
Life in 5 years	USA	971	8.08	2.06	-4.51	< .001
	Denmark	912	8.45	1.41		

Note. Life today was significantly higher than Life 5 years ago ($p < .001$) and significantly lower than Life in 5 years ($p < .001$) for both countries.

Table 8

Multiple Regression Analysis of Cantril's Ladder Against Income, Nation, Marital Status and Education

	Cantril today				Cantril past				Cantril future			
	B	SE	Beta	p	B	SE	Beta	p	B	SE	Beta	p
Intercept	7.07	0.20		0.000	6.61	0.26		0.000	7.82	0.22		0.000
Income	0.48	0.05	0.28	0.000	0.11	0.07	0.05	0.139	0.46	0.06	0.25	0.000
Nation (0 = USA)	0.94	0.08	0.27	0.000	0.99	0.11	0.23	0.000	0.59	0.09	0.16	0.000
Income*Nation	-0.24	0.08	-0.09	0.003	0.15	0.11	0.04	0.168	-0.16	0.09	-0.06	0.084
Married (0 = no)	-0.01	0.02	-0.01	0.655	0.01	0.03	0.00	0.843	-0.07	0.03	-0.07	0.007
Education	0.02	0.04	0.01	0.641	-0.05	0.05	-0.02	0.350	0.08	0.05	0.04	0.089

Note. N = 1657 for satisfaction today; N = 1657 for past satisfaction; and N = 1588 for future satisfaction

Table 9

Means (M), Standard Deviations (SD), and F-values for High and Low Groups of Law&Order in USA and Denmark

Dependent variable	country	L&O Group	N	M	SD	F Country	F L&O	F Interaction
Life today	USA	Low	427	6.83	2.12			
		High	568	7.57	1.62			
	Denmark	Low	402	7.84	1.49			
		High	596	8.10	1.24			
						108.82^{***}	46.37^{***}	10.48^{***}
Life 5 years ago	USA	Low	428	6.29	2.60			
		High	568	6.57	2.09			
	Denmark	Low	395	7.18	2.08			
		High	594	7.45	1.76			
						83.13^{***}	7.95^{**}	0.00
Life in 5 years	USA	Low	411	7.79	2.31			
		High	560	8.30	1.83			
	Denmark	Low	362	8.32	1.63			
		High	550	8.54	1.24			
						21.67^{***}	19.06^{***}	3.10
NEAG	USA	Low	429	-1.88	1.88			
		High	568	-2.58	1.49			
	Denmark	Low	396	-2.69	1.37			
		High	592	-2.88	1.22			
						67.76^{***}	43.40^{***}	14.21^{***}
POAF	USA	Low		2.49	2.11			
		High		3.06	1.76			
	Denmark	Low		2.49	2.07			
		High		2.62	2.07			
						5.66^{*}	14.41^{***}	5.43^{*}

Note. *** = p < .001; ** = p < .01; * = p < .05;

Figure captions

Figure 1. Factor structure for the ten affect items

Figure 2. Response pattern (thresholds) for three latent classes and five positive affect items

Figure 3. Response pattern (thresholds) for two latent classes and five negative affect items

Figure 4. Interaction effect from income and nation on affect.

Figure 5. Interaction effect from income and nation on Cantril's ladder.

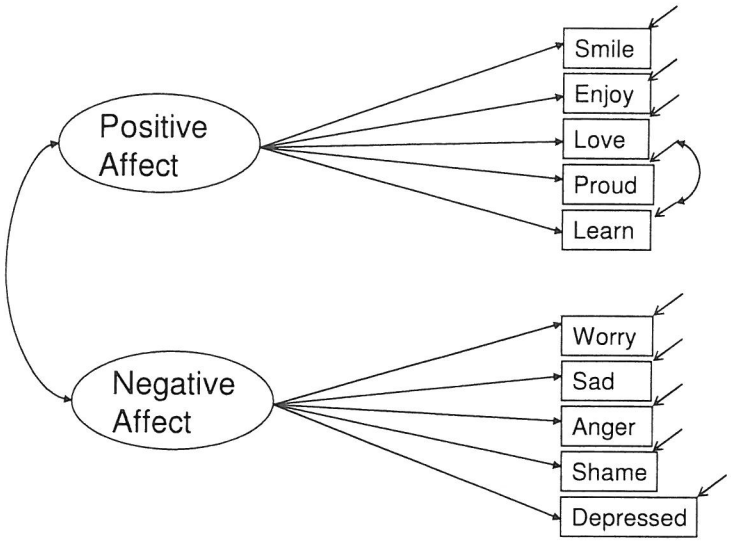

Positive Affect
Negative Affect
Smile
Enjoy
Love
Proud
Learn
Worry
Sad
Anger
Shame
Depressed

Fig. 1

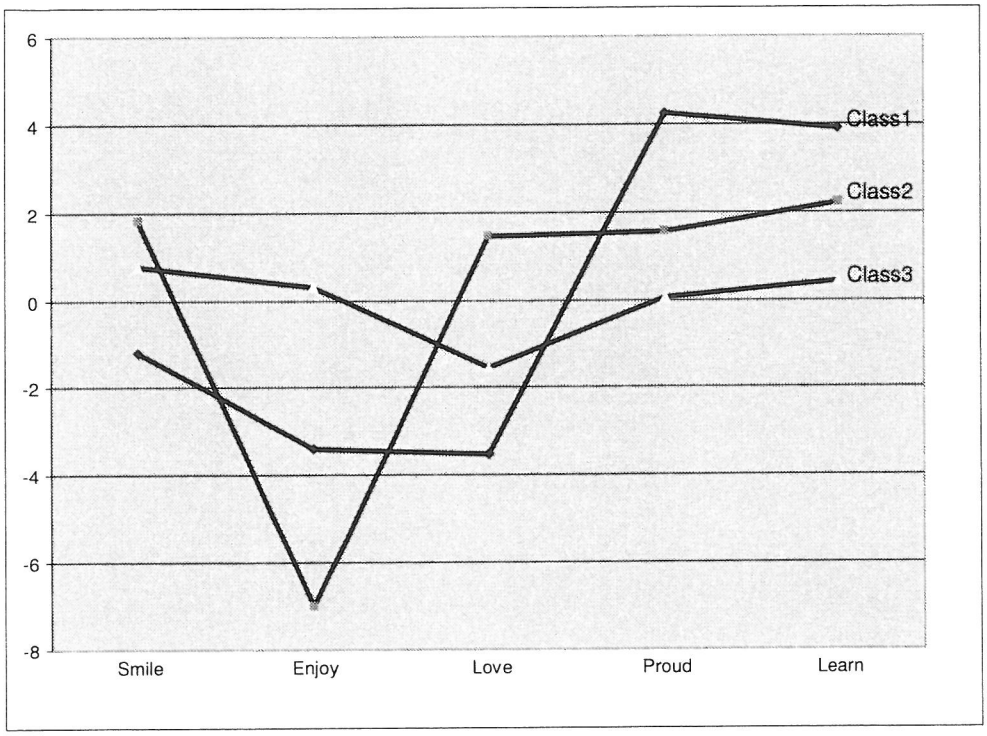

6
4
2
0
-2
-4
-6
-8
Smile
Enjoy
Love
Proud
Learn
Class1
Class2
Class3

Fig. 2

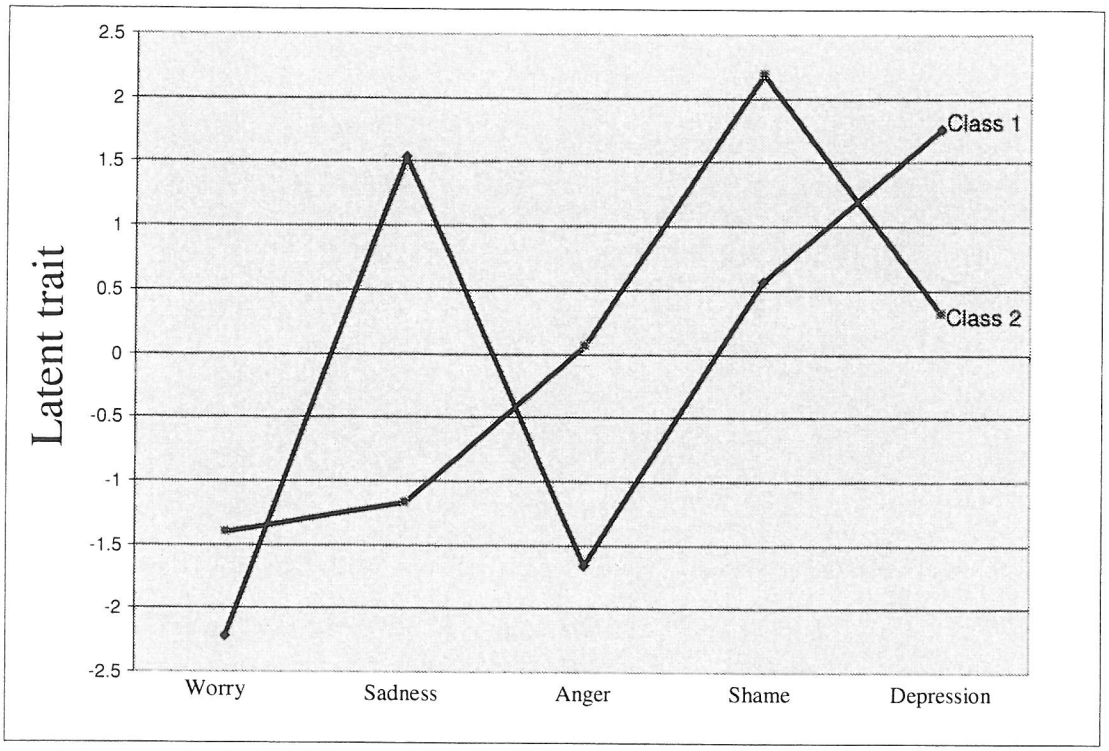
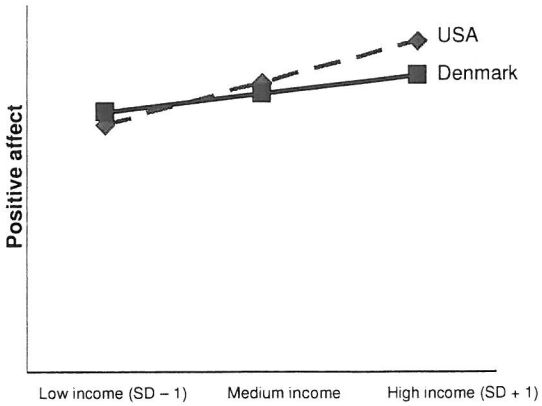

Latent trait
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
Worry
Sadness
Anger
Shame
Depression
Class 1
Class 2

Fig. 3

a)


USA
Denmark
Positive affect
Low income (SD – 1)
Medium income
High income (SD + 1)

b)

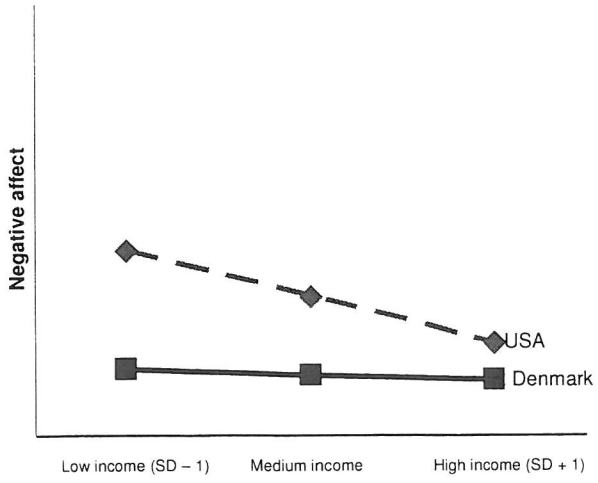

Negative affect
USA
Denmark
Low income (SD – 1)
Medium income
High income (SD + 1)

Fig. 4