Younger Adults Report More Distress and Less Well-being: A Cross-Cultural Study of Event Centrality, Depression, PTSD, and Life Satisfaction

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[1] This name uses Spanish naming customs; paternal last name is *Zaragoza* and maternal last name is *Scherman*. Please, use *Zaragoza Scherman* as the last name for citations. Thank you.

Abstract

The extent to which highly emotional autobiographical memories become central to one's identity and life story influences mental health. Young adults report higher distress and lower well-being, compared with middle-aged and/or older adults; whether this replicates across cultures is still unclear. First, we provide a review of the literature that examines age-differences in depression, post-traumatic stress disorder (PTSD), and life satisfaction in adulthood across cultures. Second, we report findings from a cross-cultural study that examined event centrality of highly positive and negative autobiographical memories along with symptoms of depression and PTSD, and levels of life satisfaction in □1000 young and middle-aged adults from Mexico, Greenland, China, and Denmark. Both age groups provided higher centrality ratings to the positive life event; however, the relative difference between the ratings for the positive and negative event was smaller in the young adults. Young adults reported significantly more distress and less well-being across cultures.

Keywords: event centrality, depression, PTSD, life satisfaction, age differences, cultural differences

Younger Adults Report More Distress and Less Well-being: A Cross-Cultural Study of Event Centrality, Depression, PTSD, and Life Satisfaction

Autobiographical memory is typically defined as the collection of memories a person has of his or her own life experiences (Neisser, 1986; Robinson, 1986). These memories are usually rich in detail, emotionally intense, and of great significance for the formation of individuals' personal self, life stories, identity, and personality (Singer & Salovey, 1993). It would indeed be difficult, if not impossible, to describe who we are, how we define our identity, tell our life stories and understand our personality without making reference to our autobiographical memories and the life events around them. Besides informing identity and life stories, research has shown that the ways in which we remember our personal lives impact mental health and well-being (e.g., Williams, 1992).

We know that the emotional valence of an event (i.e., whether it is emotionally positive, negative or neutral) has consequences for how we remember the event and the effect it has in our mood (see Holland & Kensinger, 2010; for a review). For example, healthy individuals tend to recall positive life events more vividly and with more peripheral details than negative events (D'Argembeau & Van der Linden, 2008; Talarico, Berntsen, & Rubin, 2009). This positivity bias contributes to self-enhancement, a tendency for people to cultivate favourable self-images, which is beneficial for mental health (Marshall & Brown, 2008) and has been shown to be less prevalent in East Asian samples (Heine & Hamamura, 2007). Similarly, the degree to which a specific memory is a central element in our identity and life story has important implications for mental health (Berntsen & Rubin, 2006; Berntsen, Rubin, & Siegler, 2011). A recent review of the event centrality literature indicated that individuals who rated a negative autobiographical memory to be highly central, reported higher scores of post-traumatic stress disorder (PTSD), shame, grief, depression, and anxiety (Gehrt, Berntsen, Hoyle, & Rubin, 2018).

Other factors known to influence the way we remember our lives are age and culture (e.g., Luchetti & Sutin, 2018; Wang, 2001). According to Luchetti and Sutin (2018), older adults report more vivid memories compared to younger adults (see also Rubin & Berntsen, 2009; Rubin & Schulkind, 1997). Cross-cultural studies on autobiographical memory show that East Asian participants had later earliest memories compared to their American counterparts, who also reported longer, more specific, more self-focused, and more emotionally elaborate memories (Wang, 2001). Other studies have also found cultural differences in the way mothers talk to their children about past events and how children remember these events (Tõugu, Tulviste, Schröder, Keller, & De Geer, 2012; Tulviste, Tõugu, Keller, Schröder, & De Geer, 2016; Wang, Leichtman, & Davies, 2000).

The literature on mental health also indicates that age is an influential factor in the symptomatology of psychological disorders. Numerous studies have examined age-related differences on symptoms of depression, and posttraumatic stress disorder (PTSD), and on levels of life satisfaction across the lifespan within specific societies (e.g., Fung et al., 2008; Goldbeck, Schmitz, Besier, Herschbach, & Henrich, 2007; Stordal et al., 2001). These studies concluded that, on average, younger adults report higher symptomatology for depression (Armstrong, Wuthrich, Knight, & Joiner, 2014; Fung et al., 2008; Stordal et al., 2001), PTSD (Borges, Benjet, Petukhova, & Medina-Mora, 2014), and lower scores of life satisfaction (Daig, Herschbach, Lehmann, Knoll, & Decker, 2009; Nordea-Fonden & Institut for Lykkeforskning, 2015). However, these studies have been conducted predominantly in Western societies. Furthermore, only few studies have examined whether such age differences replicate cross-culturally, when administering the same tests to young and older adults in different cultures (e.g., Deaton, 2008; Inaba et al., 2005; Norris, Kaniasty, Conrad, Inman, & Murphy, 2002; Riquelme et al., 2016). The goal of the present study is to examine the event centrality of autobiographical memories of highly emotional life events and further investigate symptoms of

depression, PTSD, and life satisfaction from a novel cross-cultural data from Mexican, Greenlandic, Chinese, and Danish samples of young and middle-aged adults.

In order to motivate our study, we first review findings on the positivity bias in autobiographical memory as well as differences in the centrality of positive and negative autobiographical events and how this may be affected by age and culture. We then review cross-cultural studies that have examined age-related differences in symptoms of depression, PTSD, or in levels of life satisfaction during adulthood (See Table 1).

Age Differences in the Emotionality of Autobiographical Memories

When trying to explain the higher symptoms of psychopathology and lower levels of well-being that have been found in younger samples in some (especially Western) studies, researchers have investigated several mediating factors and potential explanations (Allemand, Zimprich, & Hendriks, 2008; Armstrong et al., 2014; Carstensen, Isaacowitz, & Charles, 1999; Gillath, Johnson, Selcuk, & Teel, 2011; Grossmann, Na, Varnum, Kitayama, & Nisbett, 2013; Hatch & Dohrenwend, 2007; Kennedy, Mather, & Carstensen, 2004).

Frequently considered explanations that are most relevant to pursue in the present study are the *socioemotional selectivity theory* (Carstensen, 2006; Carstensen et al., 1999; English & Carstensen, 2013) and the *positivity bias in autobiographical memory* (Kennedy et al., 2004; Walker, Skowronski, Gibbons, Vogl, & Ritchie, 2009). These phenomena are partly related to each other. According to the socioemotional selectivity theory, middle-aged and older adults recall more positive memories and focus on positive information, compared to younger adults, because they are highly motivated to maintain well-being and regulate emotion. According to the theory, this is because middle-aged and older adults are more motivated to pursue emotional goals, while young adults are more motivated to pursue knowledge goals. Importantly, Carstensen et al. (1999) claimed that this increased motivation to pursue emotional goals in order to maintain well-being starts as early as middle age and reaches its

peak in old age (see Figure 1). As a result, middle-aged adults appear to be equally motivated to pursue both types of goals, while older adults are motivated to regulate their emotion (more than to gain additional knowledge about the world) as they realize that that their time left to live is getting shorter. While a number of studies have been conducted with older adults, studies with middle-aged adults are lacking (see English & Carstensen, 2013; for an overview). The positivity bias in autobiographical memory (Kennedy et al., 2004) is a general preference for recalling positive, rather than negative memories, from the personal past. Several studies have shown that it is possible to maintain positive mood, repair negative mood (Josephson, Singer, & Salovey, 1996) and cope with stress (Speer & Delgado, 2017) by recalling positive memories, which is an effective strategy to regulate emotion. According to Urry and Gross (2010), older adults achieve improved emotion regulation by frequently focusing on positive information and recalling positive memories. This positivity bias can also be observed in the tendency to consider a positive life event to be more central for one's identity and life story, in comparison to a negative life event (Berntsen et al., 2011).

Centrality of Event for Highly Emotional Memories of Positive and Negative Life Events

Autobiographical memories of life events play an important role in defining personal identity and in narrating a personal life story. Berntsen and Rubin (2006) introduced the Centrality of Event Scale (CES) to examine how important a given memory is for a person's identity and life story, and whether it serves as a reference point for the organization of other experiences. Research has found that positive events are rated as more central compared with negative events (Berntsen et al., 2011; Boals, 2010; Janssen, Hearne, & Takarangi, 2015). Rating the memory of a positive life event to be more central than the one of a negative life event seems consistent with the positivity bias of autobiographical memory, confirming the important relationship between emotion and memory.

There is substantial evidence that individuals who rate a negative event to be highly central to their identity and life stories, also have higher ratings of symptoms of psychopathology, notable PTSD (Berntsen & Rubin, 2006; Berntsen et al., 2011; Gehrt et al., 2018). To our knowledge, no studies have explicitly examined age differences in event centrality. In an earlier cross-cultural study (Zaragoza Scherman, Salgado, Shao, & Berntsen, 2015), we examined event centrality scores of autobiographical memories of highly positive and negative life events across cultures in middle-aged and older adults in Mexico, Greenland, China, and Denmark. This study replicated the finding that positive memories are considered to be significantly more central for identity and life stories than negative memories, in all cultures. Furthermore, the results revealed cross-cultural differences only for the negative memories, but not for the positive memories, suggesting that culture has a bigger influence in the experiencing and processing of traumatic and stressful events. The present study will extend this cross-cultural work by exploring age differences on event centrality of highly negative and positive memories across cultures, together with measures of depression, PTSD, and life satisfaction.

A Review of Cross-Cultural Studies on Age Differences in Distress and Well-being

Now turning to a review of previous work on cross-cultural studies on age differences in measures of distress and well-being. Our literature search covered articles from scholarly journals indexed in PsychINFO that corresponded to the following words and phrases: "depression", "PTSD"/"post-traumatic stress disorder"/"posttraumatic stress disorder" or "life satisfaction" as a subject heading, keyword, or major subject and the phrases "age difference*" and "cultural difference*" in any field, up to February 8th, 2018. Our inclusion criteria were studies that examined age-related differences on depression, PTSD symptoms, or levels of life satisfaction in adulthood across two or more cultures.

Depression. The search strategy described above generated 22 articles, one of them in Spanish. After applying our inclusion criteria, we located only two cross-cultural studies that

examined age-related differences in symptoms of depression during adulthood (Table 1). First, in a study with American and Japanese individuals, Inaba et al. (2005) reported that depression symptoms decreased with age in both cultural samples. Second, Riquelme et al. (2016) compared depression symptoms in young, middle-aged, and older adult participants from Spain, Cuba, and Mexico. They found an interaction between age and culture in symptoms of depression: Higher scores in the younger group in the Spanish sample, whereas they were higher in the older group in the Cuban and Mexican samples. These studies used the same scale to measure depression symptomatology, but employed different data analysis techniques (see Table 1). In the first study, correlation analysis showed that age was negatively correlated to depression scores in both cultures, whereas in the second study, an analysis of variance found an interaction between age and culture. Similarly, the studies also differed with respect to which age group was affected most by depression symptoms.

PTSD. The search strategy described above generated 3 articles. Two of them met our inclusion criteria: cross-cultural studies that examined age-related differences in PTSD symptoms, during adulthood. Similar to the studies examining depression above, the PTSD studies also reported conflicting results (See Table 1). A study by Norris et al. (2002) examined PTSD symptoms in participants from the United States, Mexico, and Poland who had experienced a natural disaster. They found that women reported more PTSD symptoms, compared to men, in all countries. They also found that the American middle-aged adults reported higher PTSD symptoms compared with their younger and older counterparts. In the Mexican sample, the young adults reported the highest PTSD symptoms, whereas in the Polish sample, the older adults reported the highest PTSD symptoms. Thus, these results revealed very diverse patterns across cultural samples in how PTSD symptomatology differed across young, middle-aged and older adults in these three countries. In order to explain these diverse patterns across cultures, the authors concluded that there is no effect of age as such, but "rather the

relative vulnerabilities of younger, middle-aged, and older adults depend upon the social, economic, cultural, and historical context of the disaster-stricken setting" (Norris et al., 2002, p. 171).

Ron (2014) conducted a study comparing PTSD symptoms from three generations of Jewish and Arab families in Israel who had experienced war and military operations. The sample was comprised of older adults, their adult children, and their adult grandchildren. Results showed that in both the Jewish and Arab samples, older adults experienced higher levels of PTSD symptoms than their adult children and adult grandchildren; thus, no interaction between age and culture was found. As with the studies that investigated symptoms of depression, the PTSD studies employed different measurement instruments and analytic techniques (See Table 1). Other important differences are noteworthy, such as the type of trauma (i.e., natural disaster versus war) and the fact that the Israeli study was across family generations.

Life satisfaction. Life satisfaction is indicative of subjective well-being, defined as an individual's evaluation of his or her satisfaction with life, and his or her mood and emotions (Diener & Suh, 1999). As Realo and Dobewall (2011) pointed out, studies of subjective well-being and life satisfaction have multiplied over the last 20 years and cross-cultural comparisons are widely available, especially as many countries have great interest in monitoring and improving the well being of their citizens. As a result of these developments, there is a larger body of research that has examined age-related differences during adulthood in life satisfaction, across cultures. Our search strategy generated 16 articles, of which six met our inclusion criteria (See Table 1). Five of the six studies analysed data from larger studies like the World Values Survey or other national panel surveys. First, Pethtel and Chen (2010) surveyed American and Chinese adults. The authors did not report main effects of age, but they reported

cross-cultural differences with Americans reporting higher life satisfaction, compared to the Chinese participants. No interactions between age and culture were found.

Second, Baird, Lucas, and Donnellan (2010) analysed data from national studies from Germany and Great Britain. Participants answered the question "How happy are you at present with your life as whole?" Results showed that the level of life satisfaction varied differently across the life span in the different cultural samples. In the German sample, for instance, life satisfaction was constant from adolescence to the early 70s, and then it declined steeply in older age. In the British sample, the pattern looked different, with participants reporting a decline in life satisfaction early in adulthood, an increase from mid- to late adulthood, and a second decline late in life.

Third, Butt and Beiser (1987) reported a large cross-cultural Gallup Poll in 13 nations. They compared four age groups of men and women who completed a questionnaire with a set of four indices to measure their a) satisfaction with job relations, b) satisfaction with human relations, c) satisfaction with material needs, and d) religiosity. Analyses were conducted separately for men and women. When significant differences existed across age groups, results indicated that the older group reported the highest satisfaction with human relations and materials needs, accompanied by greater religiosity. In most countries, the younger group reported the least satisfaction with human relations and material needs. However, these results were not consistent across cultures and gender. Furthermore, the authors indicated that non-Western countries showed more homogeneous scores across age groups, whereas other countries showed more pronounced differences, suggesting an interaction between age group and culture.

Fourth, Realo and Dobewall (2011) used data from several samples of Values and Social Surveys in Estonia, Sweden, Finland, and Latvia, over a span of 27 years. The authors predicted that life satisfaction would not be related to age in Finland and Sweden as they have

had a stable recent history, but that in Estonia and Latvia, having experienced critical historical events, life satisfaction could potentially be related to cohort and thus age. Participants responded to the question: "All things considered, how satisfied are you with your life as a whole these days/nowadays?" An interaction between age and culture was found: Life satisfaction was significantly different across age groups in all samples and the effect of age on life satisfaction was different across countries. In the Finnish and Swedish samples, participants younger than 40 and older than 61 years of age reported higher levels of life satisfaction whereas participants between 41 and 60 years old reported the lowest scores. In the Estonian and Latvian samples, the individuals younger than 30 years old reported being more satisfied with their life than all other age groups.

Fifth, Tilley (2002) employed the 1990 World Values Survey to investigate life satisfaction in culture clusters. His analysis classified cultures in six clusters: Anglo-Saxon (Britain, Canada, Ireland, United States); Nordic (Denmark, Finland, Iceland, Norway, Sweden); Hispanic (Argentina, Brazil, Chile, Mexico, Portugal, Spain); Western European (Belgium, France, Italy, Netherlands, West Germany); Central European (Austria, Hungary, Slovenia), and Eastern European countries (Belarus, Bulgaria, East Germany, Estonia, Lithuania, Latvia, Poland, Romania, Russia). Results showed evident cross-cultural cluster differences, while life satisfaction remained somewhat stable across age groups within each cluster.

Sixth, Deaton (2008) employed the 2006 World Poll from Gallup that surveyed samples from 123 countries. This study found that life satisfaction declines with age, except in the United States, Canada, United Kingdom, Australia, and New Zealand, all being high-income countries, where life satisfaction first decreases and then increases after middle age.

Overall, age-related differences in the levels of life satisfaction exist in some countries, but not in others, showing clear interactions between age and culture in all six studies.

Furthermore, the pattern of such differences varies from country to country. Also noteworthy for this set of studies is the diversity of measurement scales, sample sizes, and data analytic techniques (See Table 1).

Summary

In conclusion, several studies find age-related differences in self-reported levels of depression, PTSD, and life satisfaction across cultures. However, the pattern of these age differences varies substantially. An interaction between age and culture is observed in some studies, but not in others. Additionally, across cultures, there is mixed evidence as to which age group is mostly affected by symptoms of depression, PTSD and low levels of life satisfaction, and some studies report no effect of age. Comparing studies on PTSD symptoms poses an additional challenge in that they examined different traumatic experiences. Similarly, studies in life satisfaction also investigated different domains of life satisfaction in highly varied ways or used one-item measures. At the same time, differences in measurement instruments, cultural samples, data analysis strategies and the age compositions of the compared groups are found throughout the studies. This poses additional challenges when comparing studies. Furthermore, potential cohort or period effects might also be responsible for apparent age-related differences in some of the studies (Realo & Dobewall, 2011). Finally, most studies reported only one measure of symptoms of psychopathology; administering several measures would allow comparing patterns of response for different symptom dimensions and scales. Based on the results, we can conclude that while age effects seem quite robust, the effects of culture and their interactions with age effects seem to be depend on what cultures are being compared. One might assume that more dissimilar cultures might also reflect effects of age differently. Therefore, it is important to consider the differences and similarities of the cultures being compared. This study investigates whether age and culture effects interact in four different cultural samples on measures of event centrality, depression, PTSD, and life satisfaction.

The Present Study

The main objective of the present study was to compare event centrality for highly emotional negative and positive autobiographical memories as well as symptoms of depression and PTSD, levels of life satisfaction, across cultures in two age groups: Young adults between 18 and 30 years old and middle-aged adults, between 45 and 64 years old, from Mexico, Greenland, China and Denmark. As indicated above, the data from the middle-aged participants examined here were a subset of data previously reported in an article that examined relationships between depression, PTSD, life satisfaction, and event centrality across cultures (Zaragoza Scherman et al., 2015). Here we present a comparison with novel data from younger participants (see the Participants section for more details on how we arrived at the present samples). We investigated adult samples in these countries, considering that they represent both Western and East Asian cultures, with different cultural traditions, geographical locations, economies, languages, and history. Furthermore, populations from China, Mexico, and Greenland are understudied in psychological research and a deeper understanding of psychological functioning on these cultures is needed. The countries mentioned above were selected because they represent individualistic (Denmark) and collectivistic (Mexico, China, and Greenland) cultures (Hofstede, 1991). According to Markus and Kitayama (1991), a person from an individualistic culture has an *independent self-construal*. This person is occupied with establishing that he or she is a unique person, separate, and different from other people. On the other hand, a person from a collectivistic culture has an *interdependent self-construal*. This person is keenly aware of the role other people play in the surrounding social context, and he or she strives to fit harmoniously in this environment. Self-construal has been found to influence motivation, emotion, and cognition (Markus & Kitayama, 1991). Research on autobiographical memory show that these differences in self-construal in individualistic and collectivistic cultures influence how people remember their lives, how they talk about the past events with

their children, and how they tell their life stories (Tõugu, Tulviste, Schröder, Keller, & De Geer, 2011; Wang, 2013; Wang et al., 2000). For example, participants from East Asian countries typically report later earliest childhood memories compared to participants from Western countries (e.g., Wang, 2006; Wang, Conway, & Hou, 2007). Another consideration for including these three cultural samples is the degree of societal changes they have experienced during the last 40 years. Among these changes are the Chinese economic reforms of 1978 (Dauderstädt & Stetten, 2005); the home rule established in 1979 and the Self-Government Act in 2009 in Greenland (Nielsen, 2001); and increased violence and crime due to the drug trafficking in Mexico (Lohmuller, 2014). These important societal changes may have had an impact in mental health and thus a potential effect on levels of depression, PTSD, and life satisfaction. In contrast, Denmark has experienced more stable and favourable economic and social conditions during the same 40 years, including being ranked number one in happiness indices for several years (Hussain, 2014). Thus, our choice of cultural samples will further contribute to understanding how culture may interact with age-related differences in event centrality of emotional memories along with symptoms of depression and PTSD, as well as in levels of life satisfaction.

The present study is also unique in that all participants completed the same measures of depression, PTSD, and life satisfaction as well as the same measures of event centrality for highly emotional positive and negative life events. A potential strength of including several indicators of psychopathology and well-being, is that comparisons across psychological symptoms of distress can be made. For example, we can address questions regarding the consistency of age-related differences across psychological symptoms. This is important given that some disorders are comorbid and potentially affected similarly by developmental or cultural aspects (Bleich, Koslowsky, Dolev, & Lerer, 2018). Besides examining psychological distress, it is also pertinent to simultaneously investigate life satisfaction as an index of well-

being to determine how symptoms of psychopathology and life satisfaction might relate to each other, and how they are influenced by age and culture. In addition, including event centrality measures of negative and positive autobiographical memories may increase the understanding of potential underlying mechanisms related to autobiographical memory.

Hypotheses and Predictions

Centrality of event for a highly emotional negative and positive memory. Based on findings that young adults report higher levels of distress and less well-being, we expected the centrality rating of negative events to be higher for young adults, compared to middle-aged/older adults. At the same time, we expected young adults would report lower event centrality ratings for the positive events.

Depression, PTSD, and life satisfaction. As shown above, cross-cultural studies that examine age differences on depression, PSTD, and life satisfaction across adulthood report mixed results, in part due to mixed methodologies and measurements (cf. Table 1). Therefore, we have chosen to generate our hypotheses and predictions based not on our literature review, but on the socioemotional selectivity theory (Carstensen et al., 1999). As a result, we predicted that young adults would report higher levels of depression and PTSD symptoms, while also reporting lower levels of life satisfaction, compared to middle-aged adults.

Method

Participants

A total of 1233 young, and middle-aged/older adults were recruited from university student and community samples in Mexico, Greenland, China, and Denmark. First, ninety-eight participants were excluded from the sample because either they failed to complete at least 95% of the questionnaire; they were older than 40 years old (for the university student samples) and younger than 40 years old (for the community samples), or failed to follow instructions. As mentioned above, the middle-aged adult sample was originally recruited for an earlier study

(Zaragoza Scherman et al., 2015). As a result, we followed the same initial exclusion criteria as in that study. In order to make the groups more representative of young, and middle age adulthood for the present age-comparison study, in a second step, we excluded 143 participants who were younger than 18 years old or between 31 and 44 years old, or who did not report their age. Finally, 50 participants aged 65 years old and older were also excluded because we did not have enough participants in each country to make meaningful comparisons with an older age group. Therefore, the final sample consisted of 943 respondents, 553 young adults between 18 and 30 years old (70% females; M_{age} = 21.81, SD = 2.86; $M_{years\ of\ formal\ education}$ = 14.81, SD = 2.24) and 390 middle-aged adults between 45 and 64 years old (65% females; M_{age} = 52.93, SD = 5.05; ; $M_{years\ of\ formal\ education}$ = 13.80, SD = 4.27; see Table 2 for further details). These age cut-offs are based on developmental literature that considers *early adulthood* to cover 17 to 40 years of age, *transition into middle age* as 40 to 44 years of age, *middle age* as 45 to 64 years of age (Levinson, 1986). Because our young sample was university students, we restricted young adulthood to 18-30 years of age. University samples were recruited at the University of Guadalajara and the Western Institute of Technology and Higher Education in Guadalajara (Mexico); the University of Greenland in Nuuk (Greenland); the East China Normal University in Shanghai (China); and Aarhus University in Aarhus (Denmark). Community samples were recruited in Guadalajara (Mexico); Nuuk, Aasiaat, Ilulissat, Qaqortoq, and Sisimiut (Greenland); in Shanghai (China) and from 138 cities and towns all over the country (Denmark). Participants were recruited by personal invitation, posters, radio announcements, Facebook, Human Resources offices, fliers, and in university courses. Participants received no compensation, a small gift (e.g., a chocolate bar), or a monetary amount in local currency, in the form of cash, a gift certificate or a transit card, with a value equivalent to between 18 and 30 USD, for their participation.

Materials

Participants provided demographic information, such as age, nationality, gender, and the number of years they attended formal education, followed by questionnaires designed to generate cultural life scripts and to elicit autobiographical memories of life story events for a larger study (See Zaragoza Scherman, Salgado, Shao, & Berntsen, 2017; for the life script of the middle-aged/older group). Subsequently, participants completed the measures of depression, and PTSD. Then, they recalled a highly traumatic/stressful memory and a highly emotional positive memory, dated these memories, and provided event centrality ratings for each of them individually to indicate how central the event is to their identity and life story. Finally, they indicated how satisfied they were with their lives, as described below.

Centrality of event scale - negative event (CES-Negative). The CES-Negative (Berntsen & Rubin, 2006) is a 7-item self-report measure of the centrality of the most stressful or traumatic event in someone's identity and life story. First, respondents recalled a negative memory in response to the sentence: "*The most stressful or traumatic event of my life was …*" After completing the sentence with a brief label (e.g. "*when I lost my job*"), respondents indicated how old they were when the event occurred. Finally, they indicated, on a 5-point Likert Scale, (1 for "totally disagree" and 5 for "totally agree") the impact that the event has had in their lives (e.g., "*I feel that this event has become part of my identity*"). The mean rating score is reported, which can range from 1 to 5 points. This scale was found to be highly reliable in all samples (7 items; Cronbach's α = .84 - .90).

Centrality of event scale - positive event (CES-Positive). The CES-Positive is adapted from the CES-Negative (Berntsen & Rubin, 2006; Berntsen et al., 2011). It measures the centrality of the most positive event in someone's identity and life story. The procedure is the same as in the CES Negative, except that respondents now recall an event in response to the sentence: "*The most positive event of my life was…"* This scale was found to be reliable in all samples (7 items; Cronbach's α = .78 - .91).

Center for epidemiologic studies depression scale (CES-D). The CES-D (Radloff, 1977) is a 20-item self-report depression scale for the general population. Participants indicated, on a 4-point Likert scale (0 for "rarely" and 3 for "all the time"), how often they felt a particular way (e.g., "*I did not feel like eating; my appetite was poor*" and "*I felt that everything I did was an effort*") during the previous week. The total sum score is reported and ranges from 0 to 60 points; 16 points and above indicate clinical symptoms of depression. The internal consistency of the scale was found to be acceptable in all samples (20 items; Cronbach's $\alpha = .80 – .90$).

Post-traumatic stress disorder checklist – civilian (PCL-C). The PCL-C (Weathers, Litz, Huska, & Keane, 1994) is a 17-item self-report measure of post-traumatic stress disorder symptoms in response to stressful life experiences from the past. Participants indicated, on a 5-point Likert scale (1 for "not at all" and 5 for "extremely"), how much they have been bothered by a symptom (e.g., "*having difficulty concentrating*" and "*trouble falling or staying asleep*"). The total sum score is reported and ranges from 17 to 85 points; 36 points and above, in addition to responses above 3 in at least one of questions 1-5, three of questions 6-12 and two of questions 13-17 indicate clinical symptoms of PTSD. The internal consistency of the scale was found to be acceptable in all samples (17 items; Cronbach's $\alpha = .87 – .91$).

Satisfaction with life scale (SWLS). The SWLS (Diener, Emmons, Larsen, & Griffin, 1985) is a 5-item self-report measure of life satisfaction as a component of well-being. Participants indicated, on 7-point Likert scale (1 for "strongly disagree" and 7 for "strongly agree"), how satisfied they were with their lives (e.g., "*The conditions of my life are excellent*" and "*If I could live my life over, I would change almost nothing*"). The total sum score is reported; it ranges from 5 to 35 points, where 5-9 is extremely dissatisfied, 10-14 is dissatisfied, 15-19 is slightly below average, 20-24 is average, 25-29 is satisfied, and 30-35 is highly satisfied. The internal consistency of the scale was found to be acceptable in all samples

(5 items; Cronbach's α = .77 – .92).

Procedure

Data collection procedure. In Mexico, Greenland, and China, trained research assistants or the principal investigator administered the survey individually or in small groups (no more than five people), unless indicated otherwise. This standard procedure consisted in having participants complete the survey materials in the manner described below. Participants were handed a booklet with several sections and were asked to answer the survey according to specific instructions written in each section. An alternative procedure, employed only with the university students in China, consisted in having participants complete the survey on a computer, using the software Visual Studio 2013, in a room at the university library, in the presence of a graduate student who was available to answer questions. In Denmark, 15 university student participants followed the standard procedure described earlier. Another 169 university students and 200 community participants were mailed questionnaires by post. A total of 131 university students and 153 community participants returned the questionnaire by post or in person. Survey materials were back-translated from English to Spanish, Greenlandic, Chinese, and Danish, following the procedures outlined by Brislin (1970). The local ethics committee reviewed the procedure described above.

Results

Gender Differences in Event Centrality, Depression, PTSD, and Life Satisfaction

Independent sample t-tests revealed significant differences between women and men in life satisfaction scores only. In general, women (M= 25.53, SD = 6.56) reported greater life satisfaction than men (M= 24.25, SD = 6.76), $t(934) = 2.75$, $p = .006$. No significant differences were found in event centrality scores, depression (cf. Salk, Hyde, & Abramson, 2017), or PTSD, all ps < .098.

Centrality of Event for a Highly Emotional Negative and Positive Memory

We first tested the hypothesis that positive memories would be more central to identity and life story than negative memories in both young and middle-aged adults, and the hypothesis that the centrality rating of negative events would be higher for young adults, compared to middle-aged adults, and that a reverse age pattern would be seen for positive events. In order to do so, we conducted a Three-Way Emotional Valence (positive versus negative) x Age Group (young versus middle-aged) x Culture (Mexican, Greenlandic, Chinese, and Danish) Mixed ANOVA and 2 Two-Way Age Group (young versus middle-aged) x Culture (Mexican, Greenlandic, Chinese, and Danish) ANOVAs, one for negative memories and one for positive memories. Consistent with our first hypothesis, we found higher centrality ratings for positive than for negative events, $F(1, 927) = 597.14$, $p < .001$, partial $\eta^2 = .392$. We failed to find support for the second hypothesis that younger compared to middle-aged adults overall would have higher centrality ratings for negative events across cultures, $F(1, 932) = .094$, $p = .759$, partial $\eta^2 = .000$. However, we found evidence for the related hypothesis that younger compared to middle-aged adults would overall have lower centrality rating for positive events across cultures, $F(1, 930) = 37.29$, $p < .001$, partial $\eta^2 = .039$. Yet, these main effects were qualified by a number of interactions. The full model is illustrated in Figure 2. Importantly, we found a Two-Way interaction between Age group and Emotional Valence, reflecting that although both age groups rated positive events as more central than negative events, $F(1, 927) = 13.44$, $p < .001$, partial $\eta^2 = .014$, the magnitude of this difference was smaller in the young group than in the middle-aged group (see Figure 3). We also found significant interactions between Age Group and Culture for both the negative, $F(3, 932) = 28.54$, $p < .001$, partial $\eta^2 = .084$ and positive memories, $F(3, 930) = 13.09$, $p < .001$, partial $\eta^2 = .041$. These interactions reflected that the cultural differences observed on event centrality ratings showed a somewhat different pattern in the young versus the middle-aged group for both kinds of memories. For example, for the negative memories, the event centrality ratings

provided by young Greenlandic and Danish participants did not differ from each other or from those of their middle-aged counterparts, whereas the event centrality ratings for young Mexican and Chinese participants were significantly different from each other and from those of their middle-aged counterparts, but in the opposite direction (i.e., young Chinese provided lower ratings compared to middle-aged Chinese and young Mexicans provided higher ratings compared to middle-aged Mexicans). For the positive memories, no cultural differences were detected in the middle-aged adults whereas in the young adults, cultural differences were evident. Chinese participants reported significantly lower event centrality ratings for the positive event compared to Mexican, Greenlandic, and Danish participants, all *p*s < .001. As a result, age group differences were larger in the Chinese sample than in the other cultural samples (see Figure 2).

Age Group Comparisons on Depression, PTSD, and Life Satisfaction Across Cultures

We also predicted that young adults would report higher levels of depression and PTSD symptoms, along with lower levels of life satisfaction, compared with middle-aged adults (see Table 1 in the Supplemental Material for percentages of participants who reported clinical levels for depression and PTSD, and low levels of life satisfaction). We were also interested in determining whether these expected outcomes were the same across our four different cultural samples. In other words, do young adults experience more symptoms of depression and PTSD, accompanied by lower levels of life satisfaction, compared with middle-aged individuals, in similar or different ways across cultures? To answer this question, we conducted a series of two-way ANOVAs to examine whether the effect of age (young versus middle-aged) on depression and PTSD symptoms, and on levels of life satisfaction differed between individuals from different cultures (Mexico, Greenland, China, and Denmark; see Figure 4, upper panel for depression, middle panel for PTSD, and lower panel for life satisfaction).

Depression. The main effect of age was statistically significant, $F(1,911) = 53.34$, $p < .001$, partial $\eta^2 = .055$. Young participants ($M = 15.01$) reported higher levels of depression symptoms than middle-aged participants ($M = 10.80$), $p < .001$. There was also a significant main effect of culture, $F(3,911) = 4.13$, $p = .006$, partial $\eta^2 = .013$, showing that depression symptoms varied depending on the culture of origin. Post-hoc analyses of the estimated marginal means showed that Danish participants ($M = 11.16$) reported significantly lower levels of depression than Greenlandic ($M = 13.66$), and Chinese ($M = 13.52$) participants (all *p*s $< .05$). The interaction between age and cultural sample for depression was not statistically significant, although a trend was observed, $F(3, 911) = 2.30$, $p = .076$, partial $\eta^2 = .008$, see Figure 4, upper panel.

PTSD. The main effect of age $F(1, 923) = 76.31$, $p < .001$, partial $\eta^2 = .076$, and the main effect of culture were significant, $F(3, 923) = 16.60$, $p < .001$, partial $\eta^2 = .051$. However, these effects were qualified by a statistically significant interaction, $F(3, 923) = 9.93$, $p < .001$, partial $\eta^2 = .031$. Pairwise comparisons revealed that the effect of culture on PTSD symptoms appeared to be driven mainly by the young participants. Compared to middle-aged adults, young adults reported significantly higher symptoms of PTSD in the Mexican and Greenlandic samples (all *p*s $< .001$), whereas they were not significantly different in the Chinese ($p = .053$) and Danish ($p = .058$) samples, which resulted in the interaction, see Figure 4, middle panel. Overall, the distributions of the PTSD symptoms (Figure 4, middle panel) and depression symptoms (Figure 4, top panel) showed quite similar patterns.

Life satisfaction. The main effect of age was statistically significant, $F(1, 928) = 12.55$, $p < .001$, partial $\eta^2 = .013$, meaning that middle-aged ($M = 26.00$) participants reported higher levels of life satisfaction than young ($M = 24.56$) participants, $p < .001$. The main effect of culture was also significant $F(3,928) = 59.68$, $p < .001$, partial $\eta^2 = .16$. Pairwise comparisons showed that Chinese ($M = 20.76$) participants reported significantly lower levels of life

satisfaction, compared to Mexican (M = 26.51), Greenlandic (M = 27.60), and Danish (M = 26.24) participants, all ps < .001. All other comparisons were not statistically significant. The interaction between age and cultural sample for levels of life satisfaction was not statistically significant, $F(3, 928) = 2.09$, $p = .100$, partial $\eta^2 = .007$, see Figure 4, bottom panel.

Finally, in Table 3, we report correlations between the event centrality of the highly negative event and measures of depression, PTSD, and life satisfaction for both age groups and all four cultures. We obtained weak to moderate significant correlations in the expected direction for each measure. However, not all correlations reached statistical significance.

Discussion

Studies in developmental and cross-cultural psychology have established that psychological functioning varies across the life span and cultures, as developmental and sociocultural factors influence cognition and mental health (e.g., Bauer, 2006; Carstensen, 2006; Carstensen, Pasupathi, Mayr, & Nesselroade, 2000; Wang, 2016). In the present study, we examined event centrality for autobiographical memories of a highly negative and a highly positive life event and symptoms of depression and PTSD, along with levels of life satisfaction in young and middle-aged adults in Mexico, Greenland, China, and Denmark.

In this study, young adults reported lower levels of life satisfaction and positive memories were less central to their identity and life stories. Similarly, psychological symptoms of distress were consistently higher in young adults, compared to middle-aged adults, on measures of depression and PTSD. Together, these measures seem to paint a consistent picture showing higher levels of psychological distress in young adults. However, some interactions indicated important cultural differences in some of the measures, as described below.

Centrality of event for a highly negative and positive memory. Consistent with the literature on event centrality, positive events were rated to be significantly more central than negative events, both in the young and middle-aged adults. At the same time, compared to

middle-aged adults, young adults rated their positive memory to be less central. This could potentially indicate higher distress in the young adults, which would be consistent with higher symptoms of depression and PTSD, along with lower levels of life satisfaction described above, although we failed to find support for the prediction that younger adults would rate negative events as more central than middle-aged adults. An alternative explanation for why younger adults reported lower centrality scores for positive events might have to do with the kinds of events they reported. Perhaps events experienced by young adults were not as central to their identity and life stories because their identities and life stories were still under development; for example, young adults in our sample may not yet have experienced common highly central events, such as graduating from college, getting married, or having children (cf. Berntsen et al., 2011).

Regarding the observed cultural differences in the centrality scores for the positive events observed in the young participants, neither collectivism nor an interdependent self-construal seem to explain why young Chinese participants reported lower scores. However, reduced self-enhancement typically found in East Asian samples (Heine & Hamamura, 2007) could be a potential explanation.

Depression. As predicted, young adults reported more depression symptoms than middle-aged adults across all four cultural samples. These results were consistent with earlier findings, notably Inaba et al. (2005) who found that depression scores decreased with age in both American and Japanese adults and the results reported by Riquelme et al. (2016) for the Spanish young sample, whose levels of depression were higher, compared to middle-aged and older groups. However, in the study by Riquelme and colleagues, in the Mexican and Cuban samples, older adults reported higher depression scores. Our results also support the socioemotional selectivity theory. According to the theory, younger adults experience higher depression symptoms because as they are occupied with acquiring knowledge for the future,

while middle-aged adults are more motivated to maintain well-being. Another potential explanation, also in line with the tenents of socioemotional selectivity theory, is that younger adults experience more symptoms of depression because their emotion regulations skills are still developing (English & Carstensen, 2013).

PTSD. Young adults reported more PTSD symptoms, compared with middle-aged adults across in the Mexican and Greenlandic samples. These findings might reflect lower lifetime PTSD prevalence in Chinese and Danish young adults. Indeed, some studies report higher lifetime prevalence in Mexican (11.5 %) and Greenlandic (17.1%) samples, compared to a Danish (9.0%) sample (Baker et al., 2005; Elklit, 2002; Karsberg, Lasgaard, & Elklit, 2012). A study indicated that Greenlandic youth are exposed to sexual assault and suicide attempts to a greater extent than youth from other nations (Karsberg et al., 2012). Exposure to traumatic events and other demographic variables might account for the interaction between age and culture found in this study. As a result, whether or not an interaction is detected will largely depend on the cultures surveyed. Our results regarding age differences were consistent with the cross-cultural study by Norris et al. (2002), which surveyed Polish, American, and Mexican adults and found an interaction between age and culture. They also reported that after Hurricane Paulina, young adults in the Mexican sample reported higher levels of PTSD, compared to middle-aged and older adults. More cross-cultural studies are needed to further disentangle effects of age and culture (and potential interactions) on PTSD symptoms. When comparing PTSD symptoms across age groups and cultures, it is also important to consider the particular nature of the disorder; namely that there is a traumatic life event or experience that precedes the symptoms. More attention needs to be given to the specific traumatic events experienced by participants in different age groups and cultures.

Life satisfaction. As predicted, in general, young adults reported lower levels of life satisfaction. Interestingly, age-related differences in life satisfaction seemed to be less

pronounced, compared to those in depression and PTSD symptoms; meaning that while young adults reported being considerably more depressed and having considerably more symptoms of PTSD, compared to middle-aged adults, they were only slightly less satisfied with life; especially in the Mexican, Greenlandic and Danish samples, as can be seen in Figure 2, bottom panel. We did not find an interaction between age and culture, which was inconsistent with the reviewed studies (see Table 1). However, the results were consistent with the socioemotional selectivity theory. It is also worth mentioning that the Chinese sample reported the lowest life satisfaction, indicating some cross-cultural differences. These differences could potentially be explained by lower self-enhancement; however, more research is necessary to explain the cultural aspects possibly responsible for the observed differences.

Potential Limitations and Future Directions

As with other cross-sectional research studies investigating age-related differences, a potential limitation of this study is that we could not test for potential cohort or period effects. However, the fact that we observed the same pattern in age group differences (i.e., young adults reported higher levels of symptomatology) across four different cultural samples, leads us to conclude that chronological age is a likely key factor for the observed differences. Nevertheless, there might be cohort effects. For example, young adults have grown in a rapidly changing world, with the advent of the Internet and other technological developments. Longitudinal studies that follow participants through development in adulthood are needed to further investigate what developmental factors might contribute to higher symptomatology in younger adults, compared to middle-aged adults. Longitudinal studies are also needed to investigate cohort and period effects.

Another potential limitation of this study is that the surveyed samples were not representative of the entire population of young and middle-aged adults in each culture. Although this is usually ideal in psychological research, it is also costly and time consuming to

conduct studies that survey representative national samples, especially in countries like Mexico and China, with a population well over 100 million and 1 billion inhabitants, respectively. Similarly, the fact that our samples were predominantly women in all countries could be a potential limitation of the study. Although we found no significant gender differences in our dependent measures, with the exception of levels of life satisfaction, a more comparable number of men and women would be desirable.

Finally, when conducting cross-cultural studies with translated measures in different languages, there is potential risk that participants from different cultures interpret the questions differently, and that the scores reflect different endorsements of measure items rather than differences in general symptomatology. Unfortunately, there is not sufficient research to establish the equivalence of the three measures we employed in this study across all our four samples. Available studies reported that the English and Spanish version of the PCL-C are equivalent (Miles, Marshall, & Schell, 2008) and that the Chinese version of CES-D is a good measure for psychological well-being (Chou, 1997; Zhang & Norvilitis, 2002). Further research on the psychometric properties of measurement instruments across cultures is sorely needed.

Conclusion

Young adults reported significantly higher levels of depression and PTSD symptoms as well as less life satisfaction in all four cultural samples, compared with middle-aged adults. Both age groups rated the most positive event to be more central to identity and life stories than the most negative event. However, young adults rated their positive memory to be less central, compared to the middle-aged group. Overall, the findings were consistent with previous work demonstrating age-related differences in distress and well-being. We showed that these differences replicate across diverse cultural samples.

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Table 1. Cross-cultural studies that examined age-group differences in depression, PTSD, and life satisfaction

	Authors	**Cultural Samples**	**Original Dataset (if applicable)**	**Participants**	**Relevant Scales**	**Age groupings**	**Data Analysis**	**Results (Age)**	**Interaction (Age x Culture)**
Depression	Inaba et al. (2005)	United States	National Survey of Families and Households (NSFH)	8111 respondents aged 28-78	Center of Epidemiological Studies-Depression Scale (CES-D; Radloff, 1977)	-	Correlations	Depression symptoms decreased with age.	Not applicable
		Japan	National Family Research of Japan (NFRJ98)	6895 respondents, aged 28-78					
	Riquelme et al. (2016)	Spain	-	503 respondents (Mean age = 43.74, SD= 21.06)	Center of Epidemiological Studies-Depression Scale (CES-D; Radloff, 1977)	18-25 35-55 65+	ANOVA	Spain: Younger participants reported higher depression scores.	Interaction
		Mexico		674 respondents (Mean age = 52.97, SD= 20.90)				Mexico and Cuba: Older participants reported higher depression scores.	
		Cuba		330 respondents (Mean age = 46.06, SD= 24.10)					
PTSD	Norris et al. (2002)	United States	-	270 interviewees, aged 18-88, after Hurricane Andrew	Revised Civilian Mississippi Scale (RCMS; Keane, Caddell, & Taylor, 1988)	Young group: 18-39 Middle-aged: 40-59 Older: 60+	Hierarchical multiple regression	US: Middle-aged respondents reported higher PTSD scores.	Interaction
		Mexico		200 interviewees, aged 18-81,				Mexico: Young respondents	

	Authors	Cultural Samples	Original Dataset (if applicable)	Participants	Relevant Scales	Age groupings	Data Analysis	Results (Age)	Interaction (Age x Culture)
				after Hurricane Paulina				reported higher PTSD scores.	
		Poland		285 interviewees, aged 18-87, after a flood				Poland: Older respondents reported higher PTSD scores.	
	Ron (2014)	Israel - Jewish	-	130 three-generation families	Impact of Event Scale – Revised (IES-R; Weiss & Marmar, 1996)	Adult grandchildren: 20-40 Middle-aged children: 41-64 Elderly grandparents: 65+	ANOVA	Older respondents reported higher PTSD scores in both cultures.	No interaction
		Israel - Arabs		41 three-generation families					
Life Satisfaction	Pethtel & Chen (2010)	United States	-	99 participants, aged 18-92	Satisfaction With Life Scale (SWLS; Diener et al., 1985)	Young: 18-29 Older: 61-92	ANOVA	Not reported	Interaction
		China	-	89 participants, aged 19-75	Expanded Satisfaction With Life Scale (E-SWLS; Ho & Cheung, 2007)	Young: 19-25 Older: 60-75	ANOVA		
	Baird et al. (2010)	Germany	German Socio Economic Panel Study	20696 participants, aged 16-91	How happy are you at present with you life as a whole?	-	Multilevel modelling	Life satisfaction declines early in adulthood, increased in mid to late adulthood, and declined in late life.	Interaction
		Great Britain	British Household Panel Study	21448 participants, aged 16-91	How dissatisfied or satisfied are you with your life overall?			Life satisfaction declined in mid-adulthood, increased in the	

	Authors	**Cultural Samples**	**Original Dataset (if applicable)**	**Participants**	**Relevant Scales**	**Age groupings**	**Data Analysis**	**Results (Age)**	**Interaction (Age x Culture)**
								70 and declined in late life.	
	Butt & Beiser (1987)	Australia, Brazil, Canada, France, India, Italy, Japan, Korea, Philippines, Singapore, United Kingdom, United States, West Germany	World Survey of Human Values	13,858 participants, age ranged not reported	Four indices on life satisfaction with job relations, human relations, material needs, and religiosity	Under 25 25-34 35-49 50+	Separate ANOVA across age groups for males and females	Older group reported the highest satisfaction with human relations and materials needs, accompanied by greater religiosity in some countries, but not all. The younger group usually reported the least satisfaction of all groups in satisfaction with human relations and material needs, in some countries, but not all.	Interaction
	Realo (2011)	Estonia	European Values Survey, the World Values Survey and the European Social Survey from 1982-2009	8138 participants, aged 15-100	All things considered, how satisfied are you with your life as a whole these days/ nowadays?	<20 21-30 31-40 41-50 51-60 61-70 71+	ANOVA	Estonia and Latvia: Life satisfaction is lowest in the group aged 51-60.	Interaction
		Latvia		6943 participants, aged 15-100					
		Finland		11692 participants, aged 15-100				Finland and Sweden: Life satisfaction is	

	Authors	**Cultural Samples**	**Original Dataset (if applicable)**	**Participants**	**Relevant Scales**	**Age groupings**	**Data Analysis**	**Results (Age)**	**Interaction (Age x Culture)**
		Sweden		12647 participants, aged 15-100				lowest in the groups aged 41-50 and 51-60.	
	Tilley (2002)	Culture Clusters: Anglo-Saxon, Nordic, Hispanic, Western European, Central European, Eastern European	World Values Survey from 1990	-	How satisfied are you with your life?	18-24 25-34 35-44 45-54 55-64 65+	MANOVA	No age differences within clusters, but significant effects of culture.	Interaction
	Deaton (2008)	123 countries	2006 World Poll	Representative samples, aged 15+	Question about life satisfaction in the present.	15-25 60+	Correlations	Life satisfaction declines with age, except in rich countries.	Not applicable

Table 2. Sample distribution according to country and gender in both age groups

	18 – 30 years		45 – 64 years		All participants	
	N	*Females*	*N*	*Females*	*Total N*	*Total Females*
Mexico	167	64%	88	70%	255	66%
Greenland	124	79%	92	65%	216	73%
China	121	54%	121	57%	242	55%
Denmark	141	84%	89	70%	230	78%

	Mexico		Greenland		China		Denmark	
	Young	*Middle-aged*	*Young*	*Middle-aged*	*Young*	*Middle-aged*	*Young*	*Middle-aged*
	N = 164	*N = 80*	*N = 118*	*N = 88*	*N = 121*	*N = 118*	*N = 141*	*N = 89*
Depression	.19*	.13	.21*	.28**	.18*	.17	.25**	.06
	N = 163	*N = 77*	*N = 117*	*N = 86*	*N = 121*	*N = 115*	*N = 141*	*N = 88*
PTSD	.19*	.27*	.40**	.23*	.26**	.20*	.30**	.25**
	N = 162	*N = 80*	*N = 118*	*N = 87*	*N = 121*	*N = 118*	*N = 140*	*N = 89*
Life satisfaction	-.08	-.21	-.31**	-.33**	.03	.02	-.18*	-.11

Table 3. Correlations between event centrality for the negative memory and depression, PTSD, and life satisfaction and for both age groups across cultures
* $p < .05$, ** $p < .01$

Figure 1. Idealized model of socioemotional selectivity theory's conception of the salience of two classes of social motives across the life span (Redrawn and modified from Carstensen, Isaacowitz, & Charles, 1999, Figure 1, p. 169).

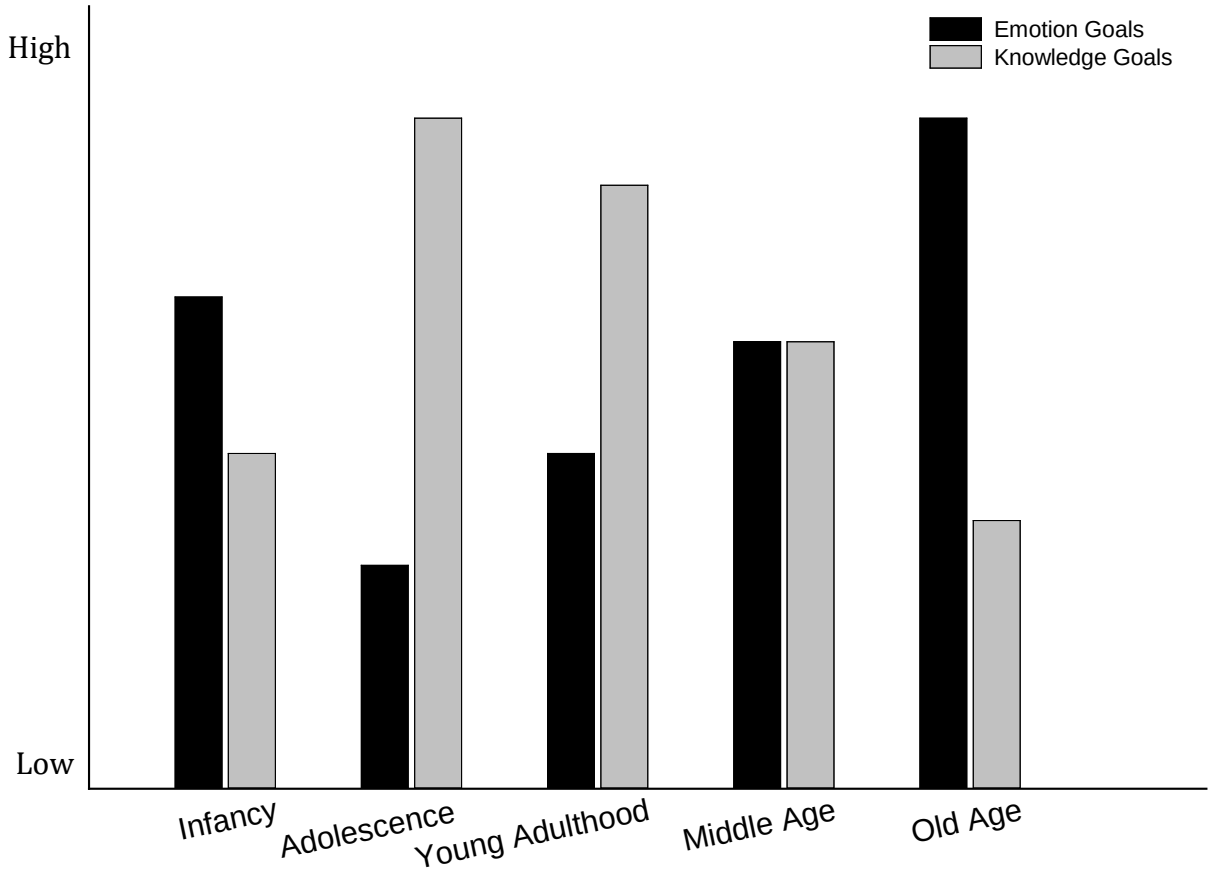


Figure 2. Mean event centrality scores for highly emotional positive and negative autobiographical memories for young (upper panel) and middle-aged/older adults (bottom panel) across cultures. Error bars represent standard errors.

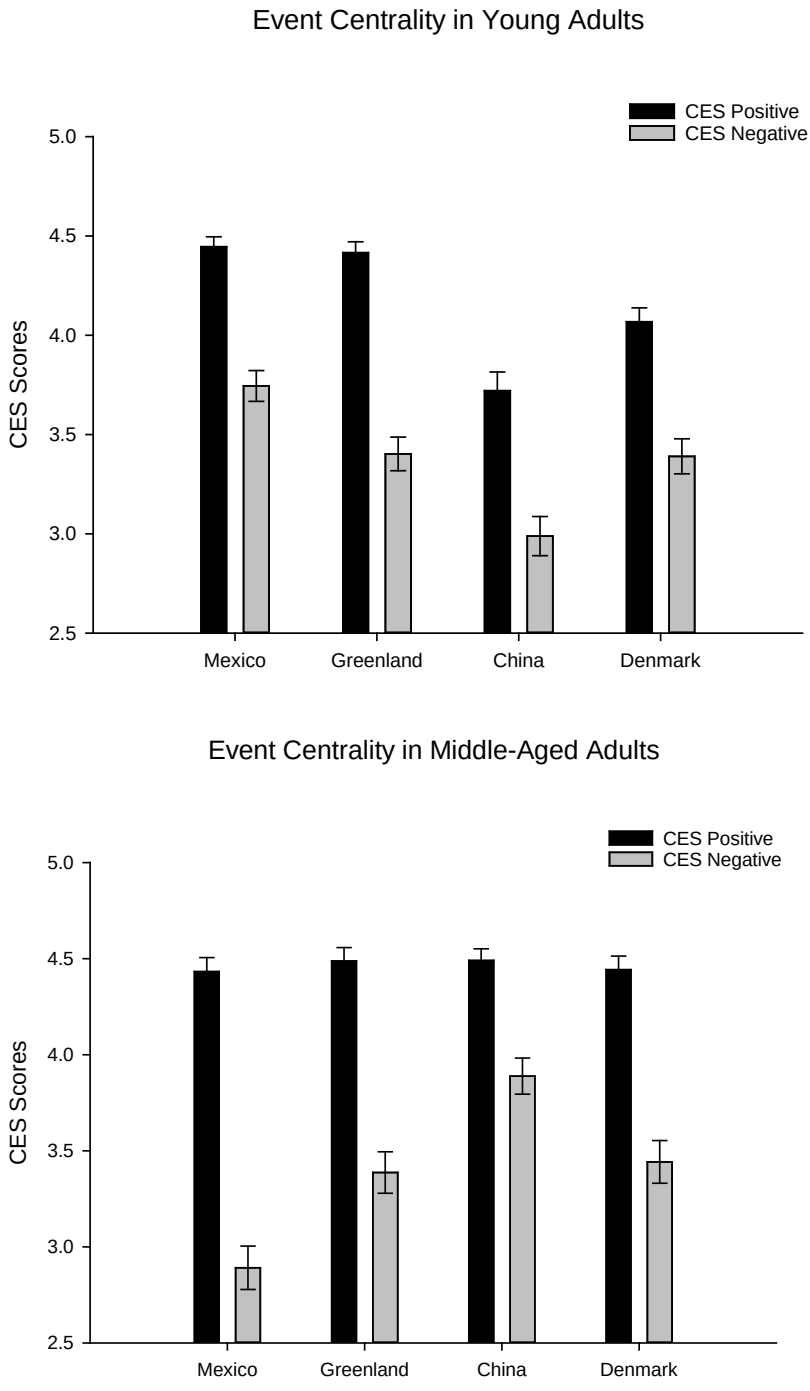


Figure 3. Mean event centrality scores for the most positive and the most negative in young and middle-aged adults. Error bars represent standard errors.

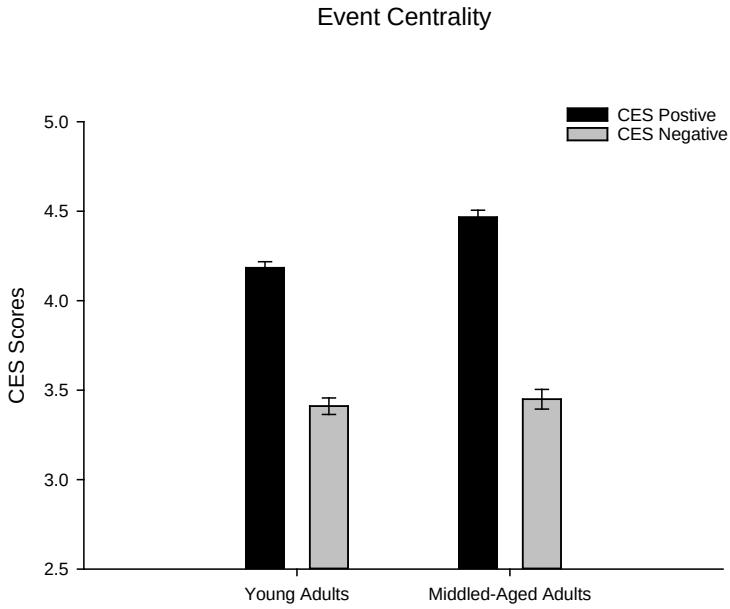
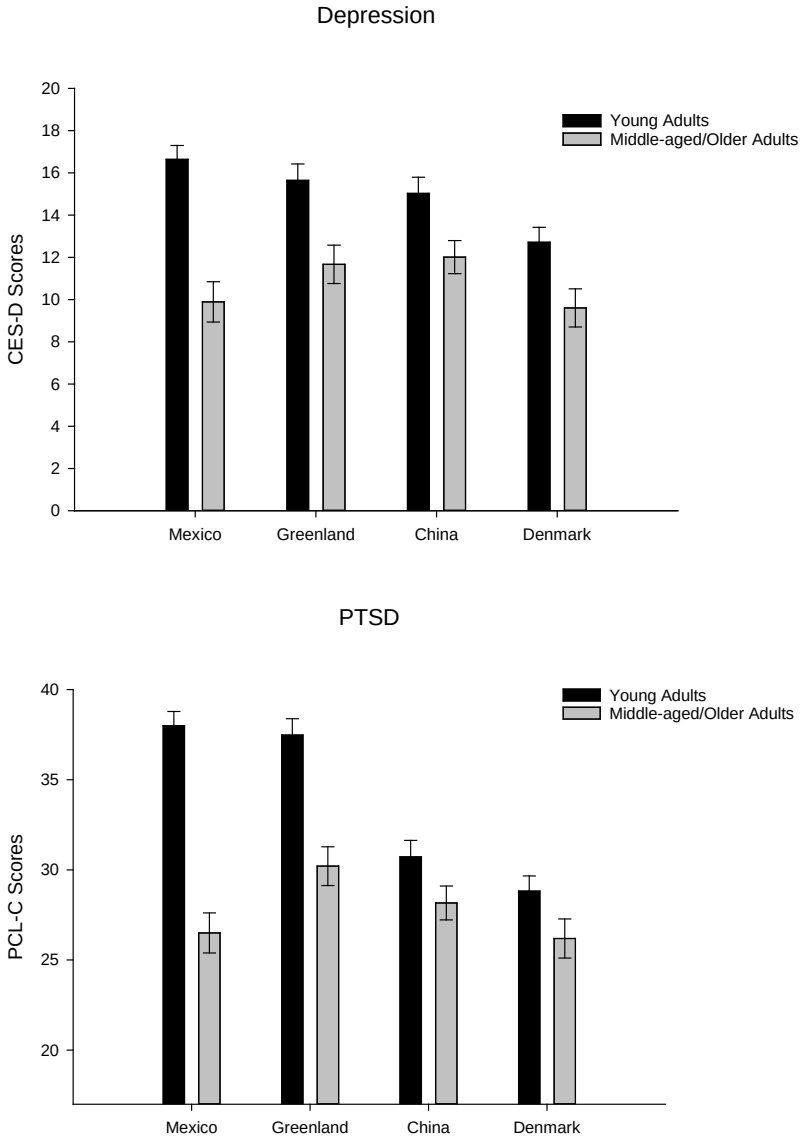
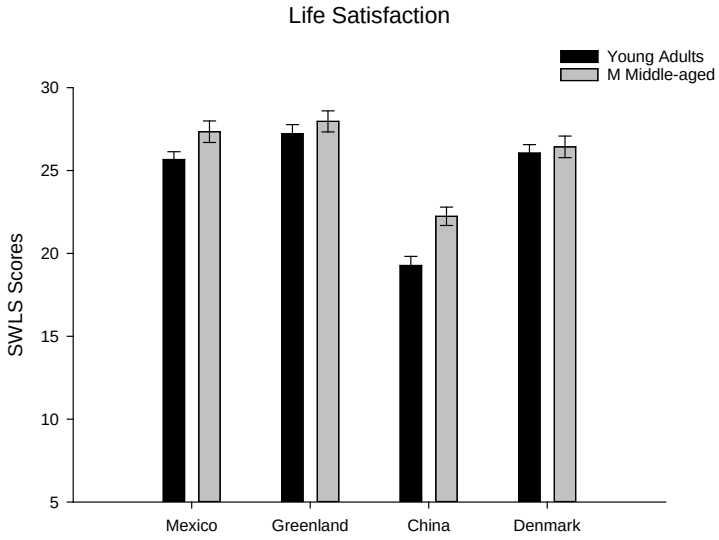


Figure 4. Mean scores for depression, PTSD, and life satisfaction for young and middle-aged/older adults across cultures. Error bars represent standard errors.





	Mexico		Greenland		China		Denmark	
	Young	*Middle-aged*	*Young*	*Middle-aged*	*Young*	*Middle-aged*	*Young*	*Middle-aged*
Depression	47%	24%	43%	30%	41%	26%	30%	15%
PTSD	30%	4%	29%	12%	12%	5%	10%	6%
Life satisfaction	17%	9%	11%	11%	52%	36%	16%	15%

Supplemental Material. Table 1. Percentage of participants who reported clinical levels of depression and PTSD, and low levels of life satisfaction for both age groups across cultures

Note: Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) cut-off: 16 points and above indicate clinical symptoms of depression. Post-traumatic Stress Disorder Checklist – Civilian (PCL-C; Weathers et al., 1994) cut-off: 36 points and above, in addition to responses above 3 in at least one of questions 1-5, three of questions 6-12 and two of questions 13-17 indicate clinical symptoms of PTSD. Satisfaction with Life Scale (SWLS; Diener et al., 1985) cut-off: 5-9 is extremely dissatisfied, 10-14 is dissatisfied, 15-19 is slightly below average, 20-24 is average, 25-29 is satisfied, and 30-35 is highly satisfied. Scores between 5 and 19 points indicate low levels of satisfaction.