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Distribución mundial de la satisfacción vital y sus determinantes: el papel del contexto social y la religión

Tesis doctoral

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World distribution of life satisfaction and its determinants: The role of the social context and religion

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Abstract

This thesis tries to contribute to general knowledge about the distribution of life satisfaction and its determinants across countries. The goal is to provide a more comprehensive view of the life satisfaction phenomenon at the cross-country level that may eventually encourage new perspectives and hypotheses about it. Additionally, the thesis may arguably contribute to research on the meaning and measurement of well-being based on insights provided by the happiness studies.

There is a well-established cross-country happiness equation that includes six factors: income, health, social support, freedom, generosity, and corruption (Helliwell & Wang, 2013). The model explains three quarters of the variation in average life evaluations across countries. Moreover, half of the explained variation is due to the social factors included in the model: social support, freedom, generosity, and corruption (the latter as a proxy for social trust and good governance), which are jointly referred to as the social foundations of happiness.

Despite the success of the model in explaining variation in average life evaluations and the fact that there is evidence that shows that the structure of the happiness equation is rather homogeneous across countries, there are three facts that should be noted. First, there are significant differences regarding the importance of different determinants across countries. Second, the determinants of life satisfaction are strongly interrelated. Third, there is an important factor left in the error term of the model: culture, which may have an impact on life evaluations and additionally play a role in the interrelation of the rest of determinants. In this regard, previous literature has identified several groups of countries that show distinct life satisfaction patterns, however, the methods used by previous research are not well suited to carry out this task and researches limit to refer to cultural differences and, at the most, to point out one particular characteristic of the groups.

Otherwise, we note the aggregate religion paradox: the fact that religiosity plays no role in the distribution of average life evaluations across countries despite the consistent evidence of a positive and significant relationship between both variables at the individual level.

In light of the previous facts we take on three specific goals in this thesis. First, systematic identification and complete characterization of groups of similar countries in terms of the joint distribution of average life satisfaction and its determinants. Second, systematic identification and complete characterization of groups of similar countries in terms of the joint distribution of the social foundations of happiness. Third, to shed light on the aggregate religion paradox studying the relationship between religiosity and life satisfaction at the cross-country level.

The main data sources used in the thesis are the World Values Survey and the European Values Study, which provide data on life satisfaction, self-reported health, family and friendship ties, interpersonal trust, confidence in institutions, self-perceived freedom of choice, tolerance of out-groups, and multiple data on the religious phenomenon for 109 countries around the world. GDP data are drawn from the World Bank's World Development Indicators, and data on social support and generosity are drawn from the World Happiness Report, which uses data from the Gallup World Poll.

We use cluster analysis to identify groups of countries that are similar among them and different in some respects from countries in other groups in terms of the distribution of life satisfaction and its determinants. Regarding the relationship between religiosity and life satisfaction at the aggregate level, we posit the hypothesis that the regulation style or motivation underlying the observance of religious prescriptions may be confounding the relationship of interest. We select some variables as possible proxies for the prevalent religious motivation and extend a standard cross-country life satisfaction model including controls for both the average level of religiosity and the prevalent motivation.

We identify five groups of countries with distinct patterns in the joint distribution of life satisfaction and its determinants. First, a group of dissatisfied countries characterized by their relatively weak social ties and low levels of collective social capital. Second, a group of dissatisfied countries characterized by their relatively strong social ties, on the one hand, and low levels of income and sense of freedom, on the other. Third, a group of satisfied countries characterized by their relatively strong social ties and high sense of freedom, on the one hand, but low levels of collective social capital, on de other. Four, a group of moderately satisfied countries characterized by their relatively high levels of income and collective social capital, on the one hand, but weak social ties and low sense of freedom on the other. And five, a group of satisfied countries characterized by showing the highest levels in all the different factors considered. The resulting clustering suggests that the main groups of countries considered by the previous literature are not as compact as it is

usually assumed.

We identify four groups of countries with distinct patterns in the joint distribution of some key aspects of the social context. First, a group of countries showing high levels of social support, individual freedom, and social cohesion (as measured by the indicators of generosity and collective social capital). Second, a group of countries showing moderately high levels of social support, intermediate levels of individual freedom, and low levels of social cohesion. Third, a group of countries showing low levels of social support, individual freedom, and social cohesion. And four, a group of countries showing low levels of social support, intermediate levels of individual freedom, and high levels of social cohesion.

Regarding the relationship between the average levels of religiosity and life satisfaction, the results are consistent with the initial hypothesis: once we control for the prevalent religious motivation the average level of religiosity emerges *ceteris paribus* positive and significantly associated with average life satisfaction. Moreover, our main proxy for the prevalent religious motivation also emerges highly significantly associated with average life satisfaction. The estimations are subjected to a wide variety of robustness checks and results remain largely unchanged. Moreover we carry out a thoroughly discussion of the endogeneity issues that may affect our results exploiting the panel nature of the data. We conclude that our results seem reasonably reliable and are consistent with findings of the previous literature.

The two classifications of countries proposed in the thesis show interesting patterns in the data. The special characteristics of each of the clusters encourage research on possible heterogeneities across clusters regarding the sources of life satisfaction, the characteristics of the distribution of life satisfaction beyond the mean, and the relationships between the different sources of life satisfaction. Moreover, both the life satisfaction and social context classifications may usefully contribute to research on the meaning and measurement of well-being and its sustainability. In this regard, we note in the thesis that economic growth is not necessarily associated with greater average happiness and that subjective well-being data have also limitations. A natural and interesting extension may be to use the factors included in the happiness equation as "dashboard of indicators" and apply suitable analyses to deal with such multivariate data. In particular, it is noteworthy that both classifications show that different configurations of the classification variables may be associated with similar levels of life satisfaction.

Regarding the results concerning the relationship between the average levels of religiosity and life satisfaction, they further support a key finding of happiness studies: the importance for subjective well-being of the feelings of autonomy, agency,

or personal control. Consequently, it would be interesting to complement data on subjective well-being with data on the underlying motivations to improve our ability to explain the impact and predict the evolution of institutions such as religions.

Future research would be benefited from further improving the data. Particularly, we have identified one paradoxical relationship between the measures of family ties and social support across countries that encourages us to search for alternative measures of both aspects to disentangle their links. Otherwise, the proposed classifications provide a snapshot of the life satisfaction and social context phenomena across countries, however, as data cover longer periods of time and evidence suggests possible structural changes we should contemplate possible dynamics. In this regard, cluster analysis can be carried out in different time periods to compare the groups found in each period and to analyse the dynamics of each country in comparative terms. Finally, in this thesis we have focused on cognitive evaluations. It would be interesting to carry out a more comprehensive analysis of the distribution of subjective well-being across countries including data on satisfaction with specific life domains, positive and negative affect, and mental health.

Resumen

Esta tesis se inscribe dentro de los estudios de la felicidad, un campo de investigación multidisciplinar que se ocupa del concepto, medición, determinantes y consecuencias del bienestar subjetivo. En particular, dentro de la disciplina económica el interés por el bienestar subjetivo ha dado lugar a un campo de investigación interdisciplinar ya consolidado: la economía de la felicidad, que combina enfoques teóricos y metodológicos tanto de la psicología como de la economía. La tesis trata de contribuir al conocimiento general sobre la distribución mundial del bienestar subjetivo y sus determinantes. El objetivo es proporcionar una visión más comprensiva del fenómeno del bienestar subjetivo a nivel internacional que facilite nuevas perspectivas e hipótesis sobre dicho fenómeno. Además, esperamos que nuestros análisis abran nuevas perspectivas sobre el significado y la medición del bienestar de los países a partir de las claves proporcionadas por los estudios la felicidad.

El interés que existe hoy en día hacia los indicadores de bienestar subjetivo se debe en gran parte a la constatación de que el crecimiento económico no está unido necesariamente a un incremento de dicho bienestar, sino que su evolución depende de las consecuencias del proceso de crecimiento sobre otros factores, como las condiciones laborales y económicas más en general, los valores y preferencias, la vida familiar y social, y la vida de la comunidad (Bartolini et al., 2013; Bartolini & Sarracino, 2015; Blanchflower & Oswald, 2004; Di Tella & MacCulloch, 2008; Mikucka et al., 2017; Pugno & Sarracino, 2019). En consecuencia, existe un creciente consenso sobre la necesidad de mejorar la información disponible para el público mediante la incorporación, entre otros, de datos sobre bienestar subjetivo en un panel de indicadores que ofrezca una imagen compresiva del nivel actual de bienestar y de su sostenibilidad (Stiglitz et al., 2018).

En este sentido, en 2009 la influyente Comisión Stiglitz-Sen-Fitoussi recomendó a las oficinas estadísticas de los países incorporar medidas de bienestar subjetivo a sus estadísticas para informar mejor las políticas públicas (Stiglitz et al., 2009). En aquel momento la Comisión Europea ya estaba comprometida en mejorar sus indicadores de bienestar incluyendo medidas sobre la percepción de la población

sobre su bienestar (Commission of the European Communitties, 2009). A día de hoy el bienestar subjetivo o "experiencia de vida" es una de las dimensiones de la calidad de vida que monitorea el Sistema Estadístico Europeo. El bienestar subjetivo también se recoge en la iniciativa *Better Life* de la OCDE. El Informe de Desarrollo Humano de las Naciones Unidas incluye indicadores de bienestar subjetivo desde 2010. Además, Naciones Unidas lanzó en 2012 el Informe Mundial de la Felicidad, que actualmente produce la Red de Soluciones para un Desarrollo Sostenible de las Naciones Unidas. A nivel nacional, se están llevando a cabo iniciativas en multitud de países por todo el mundo para desarrollar estadísticas de bienestar subjetivo e integrarlas en el proceso político. Destacan Australia, Bután, Ecuador, Emiratos Árabes Unidos, Francia, Italia, Nueva Zelanda, Países Bajos, Reino Unido y Suecia (Helliwell et al., 2012; Stiglitz et al., 2018).

Bienestar subjetivo: concepto y medición

Tanto el concepto de bienestar subjetivo como el de felicidad hacen referencia a una categoría amplia de fenómenos psicológicos que comprenden varios tipos de evaluaciones, tanto positivas como negativas, que las personas hacen de sus vidas, aquello que les ocurre, sus cuerpos y sus mentes, y las circunstancias en las que viven (E. Diener, 2006). Se distinguen dos grandes tipos de evaluaciones: las afectivas y las cognitivas. Las evaluaciones afectivas son fundamentalmente los estados y reacciones emocionales, tanto positivos como negativos, que responden a las condiciones en las que vive y los sucesos que le ocurren a la persona. Por otro lado, las evaluaciones cognitivas son juicios reflexivos que implican un proceso cognitivo en el que la persona compara aspectos de su vida, o su vida en general, con ciertos estándares de evaluación, fundamentalmente sus aspiraciones, experiencias pasadas, expectativas futuras y la situación de otras personas (Frey & Stutzer, 2002). En general las evaluaciones cognitivas no son un mero balance de los afectos experimentados durante un periodo de tiempo determinado, aunque dichas experiencias afectivas son un elemento importante en las evaluaciones cognitivas (Schimmack et al., 2002).

Un tipo de evaluación cognitiva especialmente relevante es aquella que hace referencia a la vida en su conjunto: una valoración global en la que se tienen en cuenta todos los aspectos de la vida de la persona (E. Diener, 1984; OECD, 2013). La valoración global se pude expresar como felicidad general, satisfacción vital o evaluación vital según haga referencia al nivel de felicidad, satisfacción vital o alguna medida del tipo de la escalera de Cantril (Helliwell & Wang, 2012). La satisfacción vital se suele considerar una síntesis, alcanzada de acuerdo a unos criterios determinados , de los niveles de satisfacción en los diferentes dominios que componen la

vida de la persona (E. Diener, 1984; Easterlin & Sawangfa, 2007; van Praag et al., 2003), como el trabajo o actividad principal, familia, ocio, salud, finanzas, vivienda, relaciones sociales, comunidad y medio ambiente (Cummins, 1996; E. Diener et al., 1999; Rojas, 2006; Schimmack et al., 2002).

En la tesis nos centramos en el estudio de la satisfacción vital. Hacemos referencia en muchas ocasiones al concepto de evaluación vital porque éste es un concepto más general que engloba tanto la satisfacción vital como la felicidad general y las evaluaciones vitales del tipo de la escalera de Cantril apuntadas más arriba, que son conceptos alternativos con las que trabaja la literatura y que en buena medida hacen referencia al mismo fenómeno (Helliwell & Wang, 2012). Por otro lado, utilizamos en muchas ocasiones las expresiones ecuación de la felicidad y fundamentos sociales de la felicidad, por ser expresiones generales de uso habitual, aunque, como queda dicho, nosotros nos centramos en el estudio de la satisfacción vital. La siguiente tabla resume los principales componentes del bienestar subjetivo o felicidad.

Bienestar subjetivo y felicidad: principales componentes

Bienestar afectivo		**Bienestar cognitivo**			
Afecto positivo	Afecto negativo	Evaluaciones dominios vida	Evaluaciones vitales globales		
			Felicidad general	Satisfacción vital	Evaluaciones vitales tipo escalera Cantril

Fuente: Autor.

La satisfacción vital se mide a través de autoevaluaciones que responden a las preguntas de los investigadores. Se ha comprobado que a nivel individual las medidas de satisfacción vital son estables (Eid & Diener, 2004), condición que esperamos en un fenómeno que debería responder al efecto fijo de la personalidad de la persona y sus principales circunstancias vitales, que suelen tener una alta persistencia. Además se ha comprobado que las medidas basadas en una única pregunta son válidas en comparación con las basadas en múltiples preguntas (Cheung & Lucas, 2014). Las medidas de satisfacción vital se han validado extensamente estudiando su correlación con medidas alternativas como las evaluaciones de personas cercanas y profesionales, memoria de sucesos positivos y negativos, calidad del sueño, y medidas de bienestar psicológico como la autoestima, el optimismo y la depresión. También se ha comprobado que las medidas se relacionan con patrones fisiológicos (ritmo cardíaco y presión arterial) y en la actividad cerebral. Las medidas de satisfacción vital se ha comprobado que predicen la probabilidad de enfermar y la velocidad de recuperación cuando se enferma, la probabilidad de dejar el trabajo, de que se rompa el matrimonio, de votar al partido en el poder y la esperanza de vida. Por lo

demás, también se observan las correlaciones esperadas con aquellas circunstancias vitales que normalmente deberían constituir fuentes de satisfacción vital, como son la renta personal, el estado de salud y las circunstancias laborales y familiares (E. Diener & Lucas, 1999; E. Diener & Suh, 1999; Kahneman & Krueger, 2006; Krueger & Stone, 2014; Layard, 2010; Stone & Krueger, 2018).

A pesar de que se ha comprobado la fiabilidad y validez general de las medidas de satisfacción vital se debe ser muy escrupuloso en la recolección y manejo de dichos datos porque son susceptibles de sufrir algunos errores de medida sistemáticos. Así, se ha comprobado que en algunas circunstancias las medidas presentan un sesgo de deseabilidad social: se tiende a reportar un nivel más alto de satisfacción en las entrevistas personales frente a las anónimas (E. Diener et al., 2013). Por otro lado, las palabras utilizadas en la formulación de las preguntas y de las alternativas de respuesta tienen que ser las mismas para garantizar su comparabilidad (Easterlin, 2017; Stevenson & Wolfers, 2008). Además, el orden de la pregunta dentro de la encuesta es también una fuente de sesgos. Así, preguntar por la situación financiera personal o por cuestiones políticas antes de hacerlo por la satisfacción vital sesga a la baja la medida de esta última, mientras que hacerlo por la familia, los amigos o el ocio sesga la respuesta al alza (Easterlin, 2017; Stevenson & Wolfers, 2008). Finalmente, aspectos circunstanciales como la meteorología y algunos acontecimientos recientes de efectos relativamente efímeros tienen alguna incidencia en las respuestas a la pregunta sobre la satisfacción vital. La mayor parte de estos efectos circunstanciales se cancelarían a nivel agregado, aunque algunos, por afectar a un número importante de la población, podrían reflejarse en las medidas agregadas (Kahneman & Krueger, 2006; Schwarz et al., 1987).

Indicador de la satisfacción vital media en un país

La agregación de los datos de satisfacción vital en un indicador de bienestar a nivel país requiere que las medidas sean comparables a nivel interpersonal. La evidencia que respalda la validez de las medidas de satisfacción vital sugiere que existe la suficiente regularidad en la psicología humana como para confiar en que las comparaciones interpersonales son en principio factibles (Fleurbaey et al., 2009). Las evaluaciones vitales globales se miden por lo general utilizando escalas ordinales que incluyen entre 3 y 11 categorías de respuesta, y ya hemos visto que las medidas convergen con las evaluaciones de observadores externos. En este sentido, se ha comprobado que los individuos son capaces de reconocer y predecir el nivel de satisfacción de otras personas y de traducir las categorías verbales del tipo "muy bien" o "muy mal" en valores numéricos de una forma muy homogénea. En definitiva,

los individuos parecen compartir una misma idea sobre lo que es la satisfacción vital y usar una función común para reportarla (Ferrer-i-Carbonell & Frijters, 2004). Layard (2010) señala que de otra manera sería complicado que una sociedad funcionara.

Por lo demás, la evidencia sugiere que los individuos interpretan las escalas de satisfacción vital en un sentido cardinal asumiendo que las categorías de respuesta están separadas de forma uniforme. Esto implica, por ejemplo, que la diferencia en términos de satisfacción entre un 2 y un 3 para un individuo es la misma que entre un 6 y un 7 para otro individuo (Ferrer-i-Carbonell & Frijters, 2004). De hecho, las medidas que utilizan escalas de 10 u 11 valores numéricos están explícitamente diseñadas como escalas de intervalo discretas y están por ello particularmente bien preparadas para ser tratadas como escalas cardinales (Pugno & Sarracino, 2019; Stevenson & Wolfers, 2008). Ferrer-i-Carbonell y Frijters (2004) encontraron que tratar los datos como si éstos fueran de tipo cardinal (con mismo intervalo) u ordinal apenas repercute en las estimaciones relativas a los determinantes del bienestar subjetivo.

Los indicadores de bienestar construidos a partir de datos individuales sobre satisfacción vital se suelen calcular como una simple media de éstos, lo cual tendría especial sentido cuando se utilizan preguntas que piden a los entrevistados que den una respuesta cardinal, como por ejemplo la de la Encuesta Mundial de Valores, que pide una respuesta en una escala de 1 a 10 (Stevenson & Wolfers, 2008). Stevenson y Wolfers (2008) encontraron que cinco estimaciones alternativas distintas de los niveles de satisfacción vital medios de los países, correspondiente cada una de ellas a un enfoque de cardinalización distinto, daban lugar a indicadores de bienestar altamente correlacionados. En particular, utilizaron como estimaciones del nivel medio de bienestar, en primer lugar, los efectos fijos de país estimados usando tres modelos distintos: probit ordenado, logit ordenado y probit ordenado robusto a la heteroscedasticidad (que cabe interpretar también como valores medianos independientes de la escala–Chen et al., 2019). Y por otro lado el porcentaje de individuos que reportaban un nivel de satisfacción vital mayor que 7 en la escala 1-10, además de una simple media aritmética.

Las comparaciones interpersonales dentro de un mismo país resultan poco controvertidas a día de hoy, pero no ocurre lo mismo con las comparaciones internacionales. Algunos autores albergan dudas sobre la traducción del concepto de satisfacción vital y, además, el hecho de que en algunos países pueda resultar más complicado admitir que se es infeliz complicaría más las comparaciones a nivel internacional (Blanchflower & Oswald, 2008). Sin embargo, distintos estudios sugieren que el

problema de la traducción no tiene un gran impacto sobre las medidas (ver referencias en E. Diener & Suh, 1999). En este sentido, se observa que los individuos de distintas culturas reconocen claramente emociones como el enfado, la tristeza y la alegría en la expresión facial de otras personas, lo que sugiere que existe un conjunto de emociones de carácter universal que se dan en todas las culturas; y, además, otros estudios han observado que cuando a personas de distintas culturas se les pregunta por lo que se necesita para ser feliz o estar satisfecho con la vida, las respuestas son llamativamente uniformes: se alude sistemáticamente al dinero, la salud y la familia en primer lugar (Stevenson & Wolfers, 2008).

Además, la evidencia sugiere que las diferencias culturales respecto a las normas sociales relativas a la experiencia y expresión de emociones y satisfacción no generan demasiada variabilidad espuria entre las medidas de bienestar subjetivo de los países. Por un lado, las hipotéticas diferencias respecto a la deseabilidad social del bienestar subjetivo o la familiaridad con el fenómeno no parecen tener ningún impacto (E. Diener, Suh, Smith, et al., 1995; E. Diener & Suh, 1999). Por otro lado, se observa que, efectivamente, aquellos países en los que hay una mayor aceptación de los afectos placenteros y una menor aceptación de los afectos no placenteros y en los que el nivel deseable de satisfacción vital es más alto presentan unos niveles de satisfacción vital medios más altos (E. Diener & Suh, 1999). Pero, siendo los países de Asia Oriental y del Sudeste Asiático de cultura confuciana el principal ejemplo de cultura poco favorable a los altos niveles de bienestar subjetivo, la evidencia sugiere que las medidas de bienestar subjetivo en esos países muestran niveles significativamente más bajos no por la existencia de un sesgo a la hora de reportarlo, sino por el efecto que esas normas tienen sobre el bienestar subjetivo (E. Diener, Suh, Smith, et al., 1995; Ng, 2002), probablemente por afectar a la forma en que las personas sienten y piensan sobre el mundo y sobre ellos mismos (E. Diener et al., 2013).

Ciertamente, aunque en general se observa que la ecuación de la satisfacción vital tiene una misma estructura en todos los países y culturas, existe alguna diferencia significativa en el papel de algunos determinantes (E. Diener & Diener, 1995; Schimmack et al., 2002), pero esto no afecta a la comparabilidad de los medidas de satisfacción vital. Finalmente, se ha observado en algún caso puntual un uso significativamente distinto de la escala numérica asociada a la medida de satisfacción vital por razones culturales, comprometiendo la comparabilidad directa de dichas medidas. En cualquier caso no parece ser un problema general. En este sentido, no se han encontrado diferencias significativas en el uso de la escala numérica entre dos países tan distintos y relevantes como Estados Unidos y China (ver referencias en E. Diener et al., 2013).

Determinantes de la satisfacción vital media de los países

Normalmente se asume una ecuación de la felicidad universal, y de hecho hay evidencia fuerte en este sentido respecto a los principales determinantes de las evaluaciones vitales medias de los países. Helliwell y Wang (2013) establecieron un modelo de seis factores para explicar la variación en las evaluaciones vitales medias de los países que explica aproximadamente tres cuartas partes de la misma. Dichos factores son la renta, la salud, el apoyo social, la libertad individual, la generosidad y la corrupción. Además, aproximadamente la mitad de la variabilidad explicada se debe a los cuatro factores sociales que incluye el modelo: apoyo social, libertad, generosidad y corrupción (donde esta última informaría sobre la confianza social y la buena gobernanza), que en conjunto conforman los llamados fundamentos sociales de la felicidad (Helliwell et al., 2017).

A pesar del éxito explicativo del modelo y la evidencia que sugiere que, efectivamente, la estructura de la ecuación de la felicidad es bastante homogénea en todos los países, hay tres hechos relacionados con la distribución mundial de dichas evaluaciones vitales y sus determinantes que hay que señalar.

En primer lugar, no hay que olvidar que se han encontrado diferencias significativas entre países en la importancia relativa de los distintos determinantes de la satisfacción vital (E. Diener & Diener, 1995; Schimmack et al., 2002). En este sentido cabe destacar que es mayor la relación entre el nivel de renta y la satisfacción vital en los países menos desarrollados económicamente, mientras que la sensación de libertad tiene más importancia en los países más desarrollados económicamente (Inglehart et al., 2008).

Segundo, hay que notar que existen interrelaciones complejas entre los distintos factores que se incluyen en la ecuación. Así, ya comentamos al comienzo de este resumen que el crecimiento económico puede venir acompañado de un empeoramiento en las condiciones de vida en el ámbito familiar (reflejado en un aumento en la tasa de rupturas matrimoniales) y social (reflejado en la reducción del tiempo que se pasa con amigos y familiares y en la menor participación social), que son fuentes básicas del apoyo social (Bartolini et al., 2013; Bartolini & Sarracino, 2015; Blanchflower & Oswald, 2004); y también se ha constatado que en algunos casos el incremento del PIB per cápita va acompañado de una caída en los niveles de confianza social y en las instituciones (Bartolini et al., 2013; Bartolini & Sarracino, 2015; Mikucka et al., 2017; Pugno & Sarracino, 2019).

Además, en lo que hace a los fundamentos sociales de la felicidad se considera que hay algunos mecanismos que pueden mejorar los niveles de algunos aspectos a expensas de otros. Así, es común la preocupación respecto a las posibles contradic-

ciones (*trade-offs*) entre el apoyo social y la libertad individual (E. Diener, Diener, & Diener, 1995; Helliwell et al., 2017; OECD, 2001). En este sentido, se ha encontrado que los lazos familiares, que conciernen a una de las principales fuentes de apoyo social, están negativamente relacionados con la libertad individual (Alesina & Giuliano, 2010). Por el contrario, los lazos de amistad están positivamente asociados con actitudes sociales abiertas (Pugno & Verme, 2012) que resulta más probable que faciliten una mayor libertad individual. Además de la relación entre el apoyo social y la libertad individual, es muy probable que en general existan fuertes y complejas interrelaciones entre los diferentes factores sociales.

Tercero, hay un factor importante que forma parte del término de error del modelo de Helliwell y Wang (2013): la cultura, que por un lado se ha comprobado que tiene efectos directos (y probablemente también indirectos) sobre el bienestar subjetivo. Así, las sociedades más individualistas –aquellas donde priman los objetivos y deseos personales frente a los del grupo– tienen mayores niveles de libertad individual y bienestar subjetivo (E. Diener, Diener, & Diener, 1995). Igualmente, ya hemos comentado más arriba que aquellos países con normas sociales más favorables a la experiencia y expresión de emociones y satisfacción también presentan niveles más altos de bienestar subjetivo (E. Diener & Suh, 1999). Por otro lado, la cultura es probable que juegue un papel importante en la interrelación del resto de factores.

Cabe destacar también la paradoja de la religión. A nivel individual se ha observado de forma consistente una clara relación positiva entre la religiosidad y las evaluaciones vitales. Se señala que la religiosidad tiene dos componentes: uno social y otro privado (Helliwell, 2003), y puede influir positivamente en las evaluaciones vitales a través de tres vías. Los valores y las creencias religiosas pueden, primero, conferir sentido y propósito vital (E. Diener et al., 2011) y, segundo, promover comportamientos que repercuten positivamente en la salud y producen bienestar (Deaton & Stone, 2013; McCullough & Willoughby, 2009). El componente social facilitaría la integración social de los individuos fortaleciendo los lazos familiares y de amistad (E. Diener et al., 2011; Lim & Putnam, 2010) y dando acceso a redes formales de apoyo social que facilitan tanto recursos materiales (Deaton & Stone, 2013) como identidad social (Hayward & Elliott, 2014).

A la luz de la evidencia a nivel individual esperamos encontrar una relación positiva entre la religiosidad y la satisfacción vital también a nivel agregado, pero este no es el caso, ni siquiera después de controlar por múltiples factores que influyen tanto en los niveles de religiosidad como en las evaluaciones vitales medias y, por lo tanto, podrían sesgar las estimaciones: niveles de renta, salud, seguridad y servicios públicos (Deaton & Stone, 2013).

Objetivos específicos

En esta tesis nos fijamos tres objetivos a partir de los hechos que se señalan en la sección anterior y tratando de complementar (en dos de los objetivos) o profundizar (en uno de ellos) los análisis de regresión con los que se han identificado los principales determinantes de las evaluaciones vitales medias de los países.

1. Identificar y caracterizar grupos de países similares en términos de la distribución conjunta de la satisfacción vital media y sus determinantes.

2. Identificar y caracterizar grupos de países similares en términos de la distribución conjunta de los fundamentos sociales de la felicidad.

3. Arrojar luz sobre la paradoja de la religión estudiando la relación entre la religiosidad y la satisfacción vital a nivel agregado.

Hipótesis y marco teórico

No cabe establecer unas hipótesis concretas en relación con los dos primeros objetivos porque son por naturaleza exploratorios, pero podemos presentar algunos resultados previos relacionados que resultarán útiles para interpretar nuestros propios resultados.

I

En relación con la posibilidad de distinguir grupos de países con patrones diferentes de satisfacción vital, la literatura previa ha identificado cinco grupos usando enfoques asociados al análisis de regresión, básicamente la inclusión de efectos fijos regionales y el análisis de los residuos de esas mismas regiones cuando no se incluye el efecto fijo: América Latina y el Caribe (Helliwell, 2003; Helliwell & Wang, 2013; Inglehart et al., 2008), países de cultura confuciana del Este y Sudeste Asiático (Helliwell & Wang, 2013; Ng, 2002), países ex-comunistas o economías en transición (Bjørnskov et al., 2008; Helliwell, 2003; Inglehart et al., 2008), América del Norte, Australia y Nueva Zelanda (Helliwell & Wang, 2013), y Escandinavia (Helliwell, 2003).

En relación con América Latina y el Caribe (ALC), los países de esta región muestran en promedio niveles de bienestar subjetivo mayores que los que predicen sus circunstancias. Se ha señalado que en estos países hay unos niveles de apoyo social y sociabilidad más altos que en otros países y que además estos factores son especialmente importantes para los individuos de la región (Beytía, 2016; Rojas,

2018). Además, Inglehart et al. (2008) encontraron que los individuos de ALC disfrutan de unos niveles de sensación de libertad más altos que los de otras regiones. Finalmente, E. Diener y Suh (1999) señalan que hay una tendencia en los países de esta región a ver las emociones placenteras y la satisfacción vital como algo deseable, y las emociones no placenteras como relativamente indeseables.

Los países del Este y Sudeste Asiático de cultura confuciana presentan en promedio niveles de bienestar subjetivo inferiores a los esperados dadas sus condiciones materiales de vida. Se ha señalado que en estos países hay una mayor aceptación de las emociones no placenteras y una relativamente menor aceptación de las emociones placenteras (E. Diener & Suh, 1999; Ng, 2002). Respecto a las evaluaciones vitales, se ha comprobado que en China el nivel de satisfacción vital considerado ideal es el neutro –ni satisfecho, ni insatisfecho– mientras que en otros países los entrevistados se inclinaban por un alto nivel de satisfacción vital (E. Diener & Suh, 1999). Ng (2002) señala que en este grupo de países puede haber un exceso de competitividad y conformidad a las normas. Respecto a esta última característica, se ha observado que las sociedades donde priman los objetivos colectivos, frente a los objetivos y deseos individuales, presentan menores niveles de bienestar subjetivo (E. Diener, Diener, & Diener, 1995).

Los países ex-comunistas muestran en general unos niveles de satisfacción vital inferiores a los esperados dadas sus condiciones de vida. Bjørnskov et al. (2008) argumentan que el colapso de sus sistemas políticos y económicos hundió a estos países en un largo periodo de inestabilidad cuyos efectos negativos no quedan reflejados completamente en los indicadores disponibles. Helliwell (2003) observó diferencias entre los países de Europa Central y Oriental, por un lado, y los de la antigua Unión Soviética, por el otro. En el mismo sentido Guriev y Melnikov (2018) observan que además de los países de Europa Central y Oriental, las repúblicas ex-soviéticas de Asia Central también han venido mejorando en muchos aspectos en los últimos años en relación con el resto de miembros de la Comunidad de Estados Independientes.

Por último, tanto los países escandinavos como los del grupo de América del Norte, Australia y Nueva Zelanda (ANANZ) presentan unas evaluaciones vitales medias superiores a las que predicen sus circunstancias. Los países escandinavos destacan por presentar niveles más altos en casi todos los determinantes de las satisfacción vital que otros países de la OCDE. Respecto a ANANZ, se ha señalado que en estos países existen unas fuertes normas sociales favorables a la experiencia y expresión de emociones positivas y satisfacción vital (E. Diener, Suh, Smith, et al., 1995; E. Diener & Suh, 1999).

II

En relación con la posibilidad de distinguir grupos de países con patrones diferentes en sus contextos sociales, se han comentado previamente algunos resultados interesantes al respecto. Por un lado, tenemos la tesis de que mecanismos como los lazos familiares tradicionales vinculan negativamente el nivel de apoyo social (potenciado por los lazos familiares) y el nivel de libertad individual (lastrado por dichos lazos). Sin embargo, cabría esperar una relación positiva entre el nivel de apoyo social y el de libertad individual cuando el primero viene sustentado de forma significativa por los vínculos de amistad. Por otro lado, la literatura previa ha caracterizado algunos grupos de países atendiendo a aspectos sociales. Así, se ha caracterizado a los países de América Latina como países con altos niveles de apoyo social y sociabilidad, por un lado, y con problemas en el ámbito comunitario (delincuencia, violencia, corrupción, etc.), por el otro (Rojas, 2018). El confucionismo, por su parte, es una cultura de carácter colectivista, por lo que puede estar negativamente asociada con la libertad individual y positivamente asociada con el nivel de apoyo social (E. Diener, Diener, & Diener, 1995).

III

Finalmente, en nuestra investigación sobre la relación entre la religiosidad y la satisfacción vital a nivel agregado nos apoyamos en la teoría de la autodeterminación (Ryan & Deci, 2000) para establecer la hipótesis de que el tipo de regulación que subyace a la observancia de los preceptos religiosos está sesgando a la baja la estimación de dicha relación, y que una vez controlemos por el tipo de regulación subyacente observaremos una relación positiva entre ambas variables.

La teoría de la autodeterminación establece que el impacto de una determinada institución social sobre el bienestar de las personas depende de cuál sea el principal tipo de regulación de la conducta en el que se asiente. Así, en el caso de la religión, los individuos pueden, por un lado, observar los preceptos religiosos forzados por una autoridad externa, o tratando de lograr reconocimiento externo, o para evitar sentimientos de culpa y ansiedad. Por otro lado, dicha observancia puede responder a una genuina aceptación por parte de los individuos de las prescripciones religiosas, que pueden llegar a constituir una parte fundamental de sus valores y necesidades. En este segundo caso los individuos practican la religión de forma autónoma, mientras que en el primer caso lo hacen de forma heterónoma. Ambos tipos de regulación incrementan la religiosidad, pero sólo la religiosidad autónoma tiene un efecto positivo sobre el bienestar subjetivo (Ryan et al., 1993).

Por otro lado, hay evidencia que sugiere que de los dos aspectos de la religiosidad:

el social y el del ámbito de las creencias y valores, el único relevante a efectos de la satisfacción vital es el aspecto social (Graham & Crown, 2014; Lim & Putnam, 2010). Por lo tanto, establecemos también esta hipótesis de cara a nuestra investigación.

Datos

La fuente de datos principal de la tesis es la Encuesta Integrada de Valores (1981-2014), que integra los datos de la Encuesta Mundial de Valores (WVS, 2015) y el Estudio Europeo de Valores (EVS, 2015). Estas dos encuestas recogen datos sobre bienestar subjetivo y sus principales determinantes desde 1981, en seis y cuatro olas respectivamente, de muestras representativas de 109 países de todo el mundo. Una preocupación tradicional respecto a la Encuesta Mundial de Valores era que los países de renta media y baja estaban infrarrepresentados, pero esto se ha ido corrigiendo en las últimas olas. Los datos a nivel individual recogidos por estas encuestas los agregamos utilizando los pesos proporcionados por las mismas para obtener estimaciones insesgadas de los promedios a nivel país.

La Encuesta Integrada de Valores dispone de datos que han sido utilizados extensamente para medir los distintos factores que se incluyen en la ecuación de la felicidad. Así, con los datos de esta fuente calculamos indicadores agregados de los siguientes factores: satisfacción vital, salud (estado de salud percibido medio), lazos sociales (importancia media concedida a la familia y a los amigos), capital social colectivo (niveles medios de confianza interpersonal y en la policía y el parlamento) y sensación de libertad. El indicador del PIB per cápita lo tomamos de los Indicadores del Desarrollo Mundial del Banco Mundial (World Bank, 2018).

En el estudio sobre la distribución mundial de los fundamentos sociales de la felicidad distinguimos los lazos familiares tradicionales (importancia media concedida a la familia; porcentaje que cree que los padres deben ser queridos y respetados en cualquier caso; porcentaje que cree que los padres deben buscar lo mejor para sus hijos incluso a expensas de su propio bienestar; y porcentaje que tiene como uno de sus principales objetivos hacer a sus padres sentirse orgullosos) de los lazos de amistad (importancia media concedida a los amigos). Utilizamos además, en este caso, un indicador del apoyo social calculado a partir de los datos de la Gallup World Poll (Helliwell et al., 2019). Para medir la libertad individual de naturaleza social (frente a la de naturaleza económica y política) utilizamos un indicador de tolerancia social: porcentaje que no manifiesta rechazo a la presencia de homosexuales en el vecindario. Medimos el nivel de altruismo mediante un indicador de generosidad calculado a partir de los datos de la Gallup World Poll controlando por los niveles de renta (Helliwell et al., 2019). Utilizamos el mismo indicador del capital social colec-

tivo que en el caso de los determinantes de la satisfacción vital. En todos los casos contrastamos la validez de las medidas estudiando su correlación con indicadores alternativos, en muchos casos tomados de otras fuentes a las que hacemos referencia cuando hacemos uso de ellas.

En el estudio sobre la relación entre la religiosidad y la satisfacción vital a nivel agregado controlamos por los determinantes fundamentales señalados más arriba y, además, utilizamos tres medidas del nivel de religiosidad en el país: porcentaje de personas religiosas, importancia media concedida a Dios, y frecuencia media de participación en servicios religiosos, donde las dos primeras se refieren al componente privado de la religiosidad y la última al componente social. Para medir el estilo de regulación que subyace a la religiosidad de los individuos utilizamos dos medidas potencialmente asociadas con la existencia de presiones tanto externas como internas para la observancia de los preceptos religiosos: porcentaje de individuos que consideran la fe religiosa una cualidad importante que los niños deben ser animados a aprender en casa (*chfaith*) y porcentaje que cree en el infierno (*hell*).

Métodos

Para estudiar la posible existencia de grupos de países con patrones específicos en los niveles de satisfacción vital y sus determinantes hacemos uso del análisis de conglomerados. El análisis de conglomerados es un conjunto de técnicas numéricas apropiadas para clasificar, en este caso, una muestra de países heterogéneos en un número limitado de grupos cada uno de los cuales es internamente homogéneo y singular: los países que lo forman son similares entre sí y diferentes en algún aspecto a los países de otros grupos (Everitt et al., 2011). La ventaja de este método es que clasifica a los países de forma sistemática y permite caracterizar de forma comprensiva los grupos resultantes e identificar sus características principales. La clasificación, por lo demás, facilita la interpretación de los datos en su conjunto y los de cada uno de los países.

Es importante observar que el análisis de conglomerados dispone de criterios para determinar el número apropiado de grupos o clústers en los que dividir la muestra de países. Para que la clasificación sea relevante la selección de las variables de clasificación debe ser adecuada. Para ello discutiremos en profundidad la teoría relacionada con los fenómenos objeto de análisis, además de estudiar la validez de cada una de las variables utilizadas cuando el ejercicio propuesto sea relativamente novedoso, como es el caso del análisis de los fundamentos sociales de la felicidad. Por lo demás, estudiaremos la robustez de las clasificaciones al tipo de procedimiento utilizado –en ambos casos el método principal utilizado es el análisis de conglomerados

jerárquico con el criterio de Ward (1963).

En el caso de la distribución conjunta de la satisfacción vital y sus determinantes, respecto a la que hay ciertas evidencias acerca de la existencia de grupos de países con características específicas, utilizamos algunas técnicas diseñadas para estudiar la validez de las clasificaciones que resultan del análisis de conglomerados para discutir nuestra clasificación en comparación con esas agrupaciones previas. Respecto a la clasificación resultante de aplicar el análisis de conglomerados a algunos de los principales indicadores del contexto social, llevamos a cabo un análisis de componentes principales sobre los mismos para visualizar los datos una vez comprobado que los resultados de uno y otro tipo de análisis son coherentes.

Respecto al estudio de la relación entre la religiosidad y la satisfacción vital a nivel agregado, después de discutir la novedosa interpretación que hacemos de las variables *chfaith* y *hell*, extendemos el modelo de Helliwell y Wang (2013) incluyendo nuestros controles de religiosidad y del tipo de regulación subyacente. El modelo incluye además efectos fijos regionales y del año de realización de la encuesta. Las observaciones se corresponden con valores agregados a nivel país-año (o país-encuesta). Estimamos un modelo de mínimos cuadrados ordinarios ponderado, al tratarse de un panel no balanceado. Estimamos errores estándar robustos contemplando correlaciones a nivel país. Las estimaciones son sujetas a una amplia variedad de ejercicios de robustez utilizando controles alternativos para cada uno de los factores. Finalmente, aunque no pretendemos hacer una interpretación causal de nuestros resultados, discutimos los potenciales problemas de endogeneidad que pueden afectar a los mismos explotando la condición de panel de nuestros datos. En particular, siguiendo a Clark y Lelkes (2006) estudiamos la relación entre los cambios en las medidas de religiosidad y los cambios en las circunstancias materiales y sociales mediante modelos de probabilidad lineal (comentamos las hipótesis concretas en la sección de resultados).

Principales resultados

En el capítulo 1, después de discutir en profundidad sobre los determinantes de las evaluaciones vitales medias de los países, llevamos a cabo un análisis de conglomerados usando como variables de clasificación la satisfacción vital media y cinco de sus principales determinantes: los niveles medios de renta, salud, lazos sociales, capital social colectivo y sensación de libertad. Identificamos cinco grupos de países con características singulares.

Uno de los grupos comprende todos los países europeos ex-comunistas (salvo los balcánicos) y se caracteriza, siempre en términos relativos, por mostrar unos niveles

medios muy bajos en todas las variables. Otro grupo destaca por incluir a los países escandinavos y los de la Anglosfera (Reino Unido, Irlanda, Estados Unidos, Canadá, Australia y Nueva Zelanda). Este grupo muestra los mayores niveles medios en todas las variables. En un tercer grupo destaca la presencia de los países de Europa Occidental y de Asia del Este y Sudeste Asiático de cultura confuciana (también incluye a Sudáfrica e Irán, entre otros). Este clúster destaca, por un lado, por sus altos niveles medios de renta y capital social colectivo y, por el otro, sus débiles lazos sociales y baja sensación de libertad comparado con el clúster previo. El nivel de satisfacción vital medio es moderadamente alto en este grupo. Otro grupo comprende a la mayoría de los países de América Latina y se caracteriza por sus altos niveles medios de sensación de libertad, lazos sociales y satisfacción vital, por un lado, y unos bajos niveles de capital social colectivo por el otro. Finalmente, hay un quinto grupo constituido por países del norte y este de África, los Balcanes, Oriente Próximo y Sur de Asia que muestran fuertes lazos sociales, pero, por otra parte, unos bajos niveles medios de renta, sensación de libertad y satisfacción vital.

La clasificación es robusta al método utilizado y, en general, consistente con los grupos señalados por la literatura previa, pero hay excepciones y resultados interesantes. Por un lado, la clasificación sugiere que el grupo de los países ex-comunistas no es homogéneo. En concreto, se observa que los países de los Balcanes, Cáucaso y Asia Central divergen claramente de los de Europa Central y Oriental y los de la parte europea de la Comunidad de Estados Independientes (CEI). Además, en consonancia con Helliwell (2003), estos dos últimos grupos muestran algunas diferencias entre sí. La clasificación parece reflejar los cambios acontecidos en este grupo de países en las últimas décadas (Guriev & Melnikov 2018). Respecto a los países de cultura confuciana, la clasificación sugiere que Singapur, Corea y Japón son en ciertos aspectos más parecidos a los países de otras regiones, singularmente a los de Europa Occidental, que a China, Hong Kong y Vietnam, que en comparación con los primeros muestran unos niveles más altos de capital social colectivo y lazos sociales más débiles. Finalmente, la clasificación sugiere que hay algunas excepciones relevantes dentro del por otra parte compacto grupo de los países latinoamericanos: Perú (incluido dentro del grupo de los países ex-comunistas europeos), Uruguay (incluido dentro del mismo grupo que los países escandinavos y los de la Anglosfera) y Chile (incluido dentro del grupo en el que destaca la presencia de los países de Europa Occidental y de Asia del Este y Sudeste Asiático de cultura confuciana).

En el capítulo 2, después de discutir en profundidad el concepto y los principales indicadores de los fundamentos sociales de la felicidad llevamos a cabo un análisis de conglomerados sobre seis indicadores de otros tantos aspectos del contexto social:

apoyo social, lazos familiares (tradicionales), lazos de amistad, libertad individual, generosidad y capital social colectivo. Identificamos cuatro grupos de países y proponemos una tipología basada en los tres principales rasgos diferenciadores: los niveles de apoyo social, libertad individual (medida a través del indicador de la tolerancia social) y cohesión social (medido a través de los indicadores del capital social colectivo y la generosidad). En particular, la clasificación muestra cuatro tipos de países: el tipo Alto-Alto-Alto (AAA, altos niveles de apoyo social, libertad individual y cohesión social), el tipo Alto-Medio-Bajo (AMB), el tipo Bajo-Bajo-Bajo (BBB) y el tipo Bajo-Medio-Alto (BMA).

Los países de tipo AAA se encuentran la mayoría en Europa Occidental y la Anglosfera. Estos países muestran de media el nivel más alto de satisfacción vital, la más alta proporción de individuos que se declaran muy felices, y la proporción más baja de individuos que se declaran infelices. Los países que en promedio muestran relativamente altos niveles de apoyo social, niveles intermedios de libertad individual y niveles bajos de cohesión social (países del tipo AMB) son los Iberoamericanos y los de Europa Central y Oriental. Estos países muestran en promedio niveles moderadamente altos de satisfacción vital, pero se sitúan por detrás del resto de países en cuanto a los indicadores de felicidad. Los países que de media muestran relativamente bajos niveles de apoyo social, niveles intermedios de libertad individual y niveles altos de cohesión social (países del tipo BMA) se encuentran la mayoría en el Sur y Sudeste de Asia. Estos países muestran niveles moderadamente altos de satisfacción vital y, además, de media, muestran una relativamente alta proporción de individuos muy felices y una baja proporción de infelices. Finalmente, los países del tipo BBB son la mayoría de África, los Balcanes, Oriente Próximo, Cáucaso y Asia Central. Estos países muestran en promedio los menores niveles de satisfacción vital, aunque respecto a los indicadores de felicidad presentan unos niveles similares a los de los países del tipo AMB.

En el capítulo 3 estudiamos la relación entre los niveles de religiosidad y satisfacción vital de los países. Lo hacemos extendiendo el modelo explicativo de Helliwell y Wang (2003), incluyendo controles tanto del nivel de religiosidad como del tipo de regulación que subyace a la misma (*chfaith* y *hell*). Los resultados muestran que el componente social de la religiosidad emerge positiva y significativamente relacionado con la satisfacción vital media una vez controlamos por el tipo de regulación subyacente (ya sea por medio de la variable *chfaith*, la preferida, o *hell*). Esto sugiere que, tal y como establecimos en la hipótesis de partida, la presencia del tipo de regulación en el término de error del modelo es una de las razones por las que se produce la denominada paradoja de la religión. Una vez lo incluimos encontramos que un

incremento de una desviación típica en el indicador de participación en servicios religiosos está asociado a un incremento de un décimo de desviación típica en la escala de satisfacción vital. Este efecto es equivalente al que produce un incremento de una desviación típica en el indicador de capital social colectivo o aproximadamente dos tercios de desviación típica en el indicador de salud. Es importante destacar, de todas maneras, que ese efecto positivo queda cancelado si va acompañado de un incremento similar (tres cuartos de desviación típica) en la proporción de individuos que consideran la fe religiosa una cualidad importante que los niños deberían ser animados a aprender en casa (*chfaith*).

Las estimaciones son sometidas a una amplia variedad de pruebas de robustez en las que incluimos controles adicionales y probamos otros alternativos y los resultados apenas cambian. Finalmente, discutimos los problemas de endogeneidad que pueden afectar a los resultados. Hay dos potenciales fuentes de sesgo en las estimaciones. Por un lado, tenemos la causalidad inversa: el hecho de que no sea la religiosidad la que afecte a la satisfacción vital, sino al revés. Esta es una potencial fuente de sesgo que no podemos estudiar directamente, pero sí indirectamente a través de la otra potencial fuente de sesgo: las variables omitidas. Siguiendo a Clark y Lelkes (2006), estudiamos la relación entre los cambios en las condiciones materiales y sociales de vida y los cambios en la religiosidad. Nuestro supuesto es que si ante cambios negativos (positivos) en las condiciones de vida observamos que aumenta (disminuye) la religiosidad tendremos evidencia de selección adversa: se recurre a la religión en aquellos países en los que se atraviesan problemas. Por otro lado, si ante cambios positivos en las condiciones de vida observamos que aumenta la religiosidad tendremos evidencia de causalidad inversa: interpretamos que los cambios positivos en las condiciones de vida han aumentado el sentimiento de satisfacción en el país haciendo que la gente se muestre más religiosa.

Los resultados son compatibles con la existencia de selección adversa en la participación en servicios religiosos, por lo que sugieren que el efecto estimado del componente social de la religiosidad puede estar sesgado a la baja. Por el contrario, el efecto estimado del componente privado es probable que esté sesgado al alza porque observamos, de forma consistente con Graham y Crown (2014), que en los países donde mejoran las condiciones de vida es más probable que aumente la importancia concedida a Dios. Dado que nuestros resultados se refieren al componente social concluimos que son razonablemente fiables.

Conclusiones

Para contribuir al conocimiento general sobre la distribución mundial de la satisfacción vital y sus determinantes en esta tesis hemos utilizado el análisis de conglomerados, una técnica estadística que nos ha permitido identificar grupos de países en función de sus parecidos y diferencias y hacer una caracterización completa de dichos grupos. Las clasificaciones resultantes podrían ayudarnos eventualmente a llevar a cabo análisis más ajustados del fenómeno de la satisfacción vital. Además, como argumentamos más abajo, las clasificaciones pueden proporcionar claves importantes respecto al significado y la medición del bienestar y su sostenibilidad.

Respecto a la distribución de la satisfacción vital y sus determinantes, hemos llevado a cabo un análisis de conglomerados sobre 103 países que cubren la mayor parte de las regiones del planeta utilizando como variables de clasificación los niveles medios de satisfacción vital, renta, salud, lazos sociales, capital social colectivo y sensación de libertad. Este análisis es complementario de los análisis de regresión que nos han mostrado que todos estos factores son fuentes universales de satisfacción vital. Hemos identificado cinco grupos de países con patrones específicos en la distribución conjunta de las variables de clasificación. A cada uno de los grupos le podemos asociar una etiqueta que resuma sus principales características:

- *Sociedades insatisfechas tradicionales*: grupo que incluye países del Norte y Este de África, los Balcanes, Oriente Próximo y Sur de Asia. Se caracteriza por combinar unos fuertes lazos sociales con unos bajos niveles de renta, libertad individual y satisfacción vital.

- *Sociedades insatisfechas con problemas de socialización*: grupo que incluye a los países europeos ex-comunistas (salvo los balcánicos). Se caracteriza por presentar unos débiles lazos sociales y unos bajos niveles de capital social colectivo y satisfacción vital.

- *Sociedades satisfechas libres y apegadas pero disfuncionales*: grupo en el que destacan los países latinoamericanos, caracterizado por combinar unos muy altos niveles de libertad individual, lazos sociales y satisfacción vital con unos muy bajos niveles de capital social colectivo.

- *Sociedades satisfechas florecientes*: grupo que incluye a los países escandinavos y los de la Anglosfera, caracterizado por presentar altos niveles en todas las variables.

- *Sociedades moderadamente satisfechas con ciertas dificultades*: grupo que incluye países de Europa Occidental (continental) y Este Asiático. Se caracteriza

por presentar unos altos niveles de renta y capital social colectivo y moderadamente altos de satisfacción vital, pero unos relativamente débiles lazos sociales y bajos niveles de sensación de libertad, comparado con los dos grupos anteriores.

Respecto a los grupos que habitualmente se consideran en la literatura, la contribución de nuestra clasificación es doble. Primero, en la literatura previa cuando se identifica algún efecto regional simplemente se alude a las posible singularidad cultural de esa región y a lo sumo se seãla alguna característica distintiva de la misma, mientras que nuestra clasificación ofrece una caracterización completa de los grupos de países identificados. Segundo, nuestra clasificación sugiere que varios de los grupos de países considerados en la literatura no son tan compactos como se asume habitualmente.

Como discutiremos más abajo, la clasificación es interesante en sí misma porque proporciona una visión más completa del fenómeno de la satisfacción vital a nivel internacional. Además, las especiales características de cada uno de los grupos identificados sugieren que sería interesante estudiar la posible existencia de heterogeneidades entre los grupos en cuanto a los determinantes de la satisfacción vital, las características de la distribución de ésta más allá de la media y la relación entre sus distintos determinantes.

Posteriormente llevamos a cabo otro análisis de conglomerados, en este caso sobre un conjunto específico de determinantes del bienestar conocidos como fundamentos sociales de la felicidad. Hemos utilizado como variables de clasificación indicadores de cuatro aspectos sociales básicos: apoyo social, libertad individual, altruismo y capital social colectivo, y, adicionalmente, dos indicadores sobre otros tantos determinantes del apoyo social y la sociabilidad: los lazos familiares tradicionales y los lazos de amistad, que nos pueden ayudar a identificar posibles contradicciones entre el apoyo social y la libertad individual. Hemos identificado cuatro grupos de países con patrones diferentes en la distribución conjunta de las seis variables de clasificación. A partir de las principales características del contexto social en los diferentes grupos hemos establecido una tipología de países en función de tres características: los niveles de apoyo social, libertad individual y cohesión social. A continuación presentamos una tabla que resume la tipología del contexto social propuesta y el patrón geográfico identificado.

Como señalamos en el caso de la clasificación relativa a la satisfacción vital y sus determinantes, esta tipología de países tiene interés en sí misma y, además, sería interesante estudiar posibles implicaciones.

Es importante señalar que cruzando las dos clasificaciones propuestas en esta

Tipología del contexto social

	Apoyo social	Libertad individual	Cohesión social	Patrón geográfico
Tipo AAA	Alto	Alta	Alta	Europa Occidental y Anglosfera
Tipo AMB	Alto	Media	Baja	Iberoamérica y Europa Central y Oriental
Tipo BBB	Bajo	Baja	Baja	África, Balcanes, Oriente Próximo, Cáucaso y Asia Central
Tipo BMA	Bajo	Media	Alta	Sur y Sudeste de Asia

Fuente: Autor.

tesis emerge una aparente incongruencia. En la clasificación relativa a la satisfacción vital los países de Europa Central y Oriental son catalogados como sociedades con problemas de socialización porque, entre otras cosas, presentan lazos sociales débiles, mientras que en la clasificación relativa al contexto social estos países muestran unos niveles moderadamente altos de apoyo social. En el caso contrario encontramos a multitud de países de África, los Balcanes, Oriente Próximo y Asia Central, que muestran unos fuertes lazos sociales en la clasificación relativa a la satisfacción vital, pero unos niveles bajos de apoyo social en la clasificación relativa al contexto social. La incongruencia estriba en que los lazos sociales se suelen considerar un mecanismo asociado al apoyo social. Este supuesto es consistente con la evidencia relativa a los lazos familiares tradicionales (Alesina & Giuliano, 2007) y a los propios lazos sociales más en general (Domínguez & López-Noval, 2020). Sin embargo, cuando analizamos en profundidad el concepto de fundamentos sociales de la felicidad encontramos que los lazos familiares tradicionales y el apoyo social emergen fuerte y negativamente correlacionadas a nivel agregado. Volveremos sobre este punto cuando hagamos mención a las limitaciones y futuros desarrollos de nuestra investigación.

Teniendo esta cuestión presente, creemos que tanto la clasificación relativa a la satisfacción vital como la del contexto social pueden contribuir a la investigación sobre el significado y la medición del bienestar y su sostenibilidad. En este sentido las medidas de bienestar subjetivo han sido saludadas por su utilidad para identificar las principales fuentes del bienestar (Krueger y Stone, 2014; Layard, 2010; Oswald, 1997) y los hallazgos de la economía de la felicidad en relación con las consecuencias del crecimiento económico han contribuido a una corriente académica más amplia que señala las limitaciones del PIB y medidas relacionadas como indicadores de desarrollo (Deaton & Stone 2013; Di Tella & MacCulloch 2008). La evidencia muestra que el crecimiento económico no está necesariamente asociado a un mayor nivel de felicidad, sino que la evolución de esta última depende también de otros factores, como la confianza social y la desigualdad, que pueden verse afectados durante el proceso (Mikucka et al., 2017, Pugno & Sarracino, 2019). En consecuencia, para mejorar la

información disponible para el público, hay un consenso creciente sobre la necesidad de incluir datos de bienestar subjetivo en un panel de indicadores dirigido a proporcionar una imagen comprensiva del bienestar actual y su sostenibilidad (Stiglitz et al., 2018). En este sentido, Stiglitz et al. (2018) señalan que para contabilizar de forma completa los efectos de una recesión económica es necesario monitorizar también el bienestar subjetivo de la población. Más en general, parece improbable que se pueda ser plenamente consciente de la difícil situación que atraviesan países como los Estados Unidos (Graham, 2017) o Italia (Pugno & Sarracino, 2019) sin información sobre las tendencias de largo plazo en el bienestar subjetivo de esos países (y de la misma forma podemos pensar que los datos sobre bienestar subjetivo de los países más prósperos complementa los indicadores objetivos proporcionando claves importantes).

Por otro lado, como discutimos en la introducción de la tesis, los datos de bienestar subjetivo tienen limitaciones importantes y deben complementarse con otros indicadores para proporcionar de forma combinada una imagen comprensiva del bienestar actual y su sostenibilidad. Una extensión natural e interesante en este sentido es utilizar los factores incluidos en la ecuación de la felicidad como panel de indicadores y aplicar técnicas apropiadas para tratar esos datos multivariantes. En este sentido, las dos clasificaciones resultantes de los análisis de conglomerados llevados a cabo en esta tesis proporcionan una imagen razonable e informativa del estado de los diferentes países en relación a los fenómenos de la satisfacción vital y del contexto social. Resulta particularmente interesante que ambas clasificaciones sugieren que diferentes configuraciones de los determinantes están asociadas con niveles similares de bienestar subjetivo.

En el último capítulo de la tesis hemos tratado de arrojar luz sobre la relación entre los niveles de religiosidad y satisfacción vital de los países apoyados en la teoría de la autodeterminación (Ryan & Deci, 2000). La principal conclusión que extraemos de nuestros resultados es que, consistente con las predicciones de la teoría de la autodeterminación, el estilo de regulación que subyace a la observancia de los preceptos de una institución, en este caso religiosa, determina los efectos de dicha institución sobre el bienestar subjetivo. Esta evidencia refuerza un hallazgo fundamental de los estudios de la felicidad: la importancia para el bienestar subjetivo de los sentimientos de autonomía, agencia o control (Stutzer, 2020). Este resultado indica que sería interesante complementar los datos de bienestar subjetivo con datos sobre el tipo de regulación para aumentar nuestra capacidad para explicar el efecto y predecir la evolución de instituciones como las religiones.

Limitaciones y futura investigación

En primer lugar hay que destacar que en futuros desarrollos de la investigación se debe hacer un esfuerzo por mejorar los datos sobre los distintos fenómenos estudiados. Respecto al papel que juega el estilo de regulación en la relación entre la religiosidad y la satisfacción vital a nivel agregado es importante buscar medidas más específicas sobre el mismo. También cabe expresar dudas sobre la calidad de los indicadores del apoyo social y la sociabilidad. En este sentido es especialmente llamativa la paradójica relación que observamos entre los lazos familiares tradicionales y el apoyo social, y la distintas conclusiones que obtenemos cuando utilizamos los lazos sociales (que también incluyen los lazos de amistad) como indicadores del apoyo social y la sociabilidad, frente a cuando utilizamos la medida del apoyo social tomada del Informe Mundial de la Felicidad.

En este momento no podemos explicar esta paradójica relación. La evidencia sugiere que el indicador de los lazos familiares realmente refleja algún tipo de apoyo social, sin embargo cabe preguntarse si los lazos familiares son en realidad una forma de colectivismo que proporciona felicidad no a través del apoyo social sino a través de otros canales (por ejemplo como fuente de sentido y propósito vital). O bien si los lazos familiares están asociados a un tipo de apoyo social diferente al que los individuos valoran cuando contestan a la pregunta de Gallup sobre el apoyo social. O bien si existen diferencias culturales que producen sesgos en alguna de las medidas. ¿Afecta el sesgo de la deseabilidad social a la medida de los lazos familiares en algunos países? ¿Está la medida del apoyo social percibido de Gallup sesgada positivamente en relación con el apoyo social realmente disponible? Debemos dejar estas cuestiones para futuras investigaciones. Lo único que podemos hacer en este momento para evitar la aparente incongruencia es no pensar en la medida de los lazos sociales como una medida del apoyo social en la clasificación relativa a la satisfacción vital, pendientes de esa futura investigación.

En algunos puntos de la tesis discutimos las preocupantes tendencias en el bienestar subjetivo y el contexto social en países como Estados Unidos e Italia en las últimas décadas. Sin embargo, este hecho no aparece reflejado en las clasificaciones relativas a la satisfacción vital y al contexto social propuestas en esta investigación, en las cuales Estados Unidos aparece incluido entre las *sociedades satisfechas florecientes* e Italia entre las *sociedades moderadamente satisfechas con ciertas dificultades*, y ambos países son clasificados como países del tipo AAA, respectivamente. ¿Comprometen las evidencias de este tipo la validez y la utilidad de estas clasificaciones? Lo primero que hay que señalar es que, como notamos en multitud de ocasiones, la mayoría de los factores incluidos en la ecuación de la felicidad

y los distintos aspectos del contexto social son muy persistentes en el tiempo, por lo tanto no esperamos que se produzcan grandes cambios en el corto plazo. Además, el análisis de conglomerados permite estudiar las condiciones particulares de cada país a través de su distancia (en términos generales o atendiendo a alguna característica particular) respecto al centroide u otros países de su propio conglomerado o los de otros conglomerados.

Por otra parte, a pesar de su persistencia, los determinantes del nivel de satisfacción vital son susceptibles de sufrir cambios significativos a medio y largo plazo, como muestra la evidencia respecto a Estados Unidos e Italia. En nuestra investigación hemos agregado datos de múltiples olas de las encuestas llevadas a cabo a lo largo de varias décadas para compensar las fluctuaciones de los datos que responden al ciclo económico, que en muchos casos varía de un país a otro, y otras circunstancias coyunturales. Sin embargo, a medida que los datos cubren periodos más largos de tiempo y la evidencia sugiere posibles cambios estructurales en la distribución conjunta de la satisfacción vital y sus determinantes, debemos contemplar la posibilidad de que esos cambios se produzcan. En este sentido, el análisis de conglomerados puede llevarse a cabo en periodos de tiempo diferentes para comparar los grupos hallados en cada periodo y analizar la dinámica de cada país en términos comparativos (Tezanos & Sumner, 2013).

Finalmente, en esta tesis nos hemos centrado en el análisis de las evaluaciones cognitivas. Sería interesante llevar a cabo un análisis más comprensivo de la distribución mundial del bienestar subjetivo (y su evolución) incluyendo otras dimensiones de esta amplia categoría de fenómenos (E. Diener et al., 1999). Así, lo mismo que hemos argumentado que es importante estudiar la distribución conjunta de la satisfacción vital y sus determinantes, sería interesante complementar los datos sobre la satisfacción vital con datos sobre la satisfacción con dominios de vida específicos, como el trabajo y la vida familiar, los afectos positivos y negativos, y la salud mental. En este sentido, es reseñable la evidencia de Helliwell et al. (2019) que muestra un aumento sostenido en los afectos negativos desde el año 2010 en el mundo, periodo en el que los niveles de satisfacción vital y afectos positivos han permanecido en general estables.

Chapter 1

Introduction

This thesis falls within the scope of happiness studies, a multidisciplinary field of research that deals with the concept, measurement, sources, and consequences of subjective well-being. In particular, within economics the interest in subjective well-being has given rise to an already well-established interdisciplinary field of research known as the economics of happiness, which combines theoretical and methodological approaches from both psychology and economics.

Subjective well-being and happiness are two interchangeable concepts that refer to a broad category of mental phenomena encompassing "various types of evaluations, both positive and negative, that people make of their lives ..., the events happening to them, their bodies and minds, and the circumstances in which they live" (E. Diener, 2006, p. 153).[1] Importantly, it includes a global appraisal that takes into account all aspects of a person's life (E. Diener, 1984). This global appraisal is usually referred to as (overall) life evaluation, and sometimes as life satisfaction (albeit the life evaluation may be carried out in different terms).

The thesis tries to contribute to general knowledge about the distribution of subjective well-being and its determinants across countries. The goal is to provide a more comprehensive view of the life satisfaction phenomenon at the cross-country level that may eventually encourage new perspectives and hypotheses about it. Additionally, the thesis may arguably contribute to research on the meaning and measurement of well-being based on insights provided by happiness studies.

Current interest in subjective well-being is partly due to the evidence that economic growth is not necessarily linked to greater average happiness but that the evolution of the latter depends on a number of factors that may be altered during the process, in particular, the economic and working conditions more generally,

[1] Subjective well-being is a more scientific term in the sense that its definition is unambiguous, whereas happiness refers sometimes to specific aspects of subjective well-being. In general we use them as interchangeable concepts.

people's values and preferences, family life, social relationships, and the community and the larger society circumstances (Bartolini et al., 2013; Bartolini & Sarracino, 2015; Blanchflower & Oswald, 2004; Di Tella & MacCulloch, 2008; Mikucka et al., 2017; Pugno & Sarracino, 2019). Accordingly, there is a growing consensus on the necessity, in order to improve the information available to the public, of including subjective well-being data in a dashboard of indicators "aimed at providing a comprehensive picture of current well-being and of its sustainability" (Stiglitz et al., 2018, p. 34).

In this regard, in 2009 the highly influential "Stiglitz-Sen-Fitoussi Commission" recommended statistical offices to incorporate subjective well-being measures to inform public policies (Stiglitz et al., 2009). The European Commission was already committed to better measure progress complementing GDP data with measures of "people's perception of well-being" (Commission of the European Communities, 2009). Nowadays, subjective well-being or the "overall experience of life" is one of the quality of life dimensions monitored by the European Statistical System. Subjective well-being is also monitored in the OECD's Better Life initiative. The United Nations' Human Development Report includes subjective well-being indicators since 2010 (UNDP, 2010). Moreover, the UN launched in 2012 the World Happiness Report (Helliwell et al., 2012), which is currently produced by the United Nations Sustainable Development Solutions Network, an important organization linked to the Sustainable Development Goals. At the national level, some interesting initiatives are carried out in different countries around the world further developing subjective well-being statistics and integrating them into the policy cycle. Those countries are Australia, Bhutan, Ecuador, France, Italy, Netherlands, New Zealand, Scotland, Sweden, United Arab Emirates and United Kingdom (Helliwell et al., 2012; Stiglitz et al., 2018).

In this introduction we first comment how the concept of happiness has been recently (re)introduced in economics. Then we discuss some important aspects of happiness studies, thus, the concept and measurement of subjective well-being, the aggregation of individual-level measures into indices of average subjective well-being, concerns about the happiness account of well-being, and reasons that have made of subjective well-being measures very relevant social indicators. Afterwards, based on the literature on the relationship between economic growth and subjective well-being, we introduce the main determinants of countries' average life evaluations. Finally we present the main goals and results of this thesis.

1.1 The economics of happiness: from objective to subjective utility

The economics of happiness was born as an empirical test of the traditional economic assumption that there is a positive link between economic welfare and welfare in general (Pigou, 1932); and, particularly, that changes in economic welfare, as measured by national product, indicate changes in general welfare in the same direction, if not in the same degree (Easterlin, 1974).

Regarding the concept of general welfare, Easterlin adopted a subjective happiness approach. Thus, he used individual-level data from two different types of survey questions that ask individuals how they are faring globally in their lives. On the one hand, the Gallup-poll-type direct question: "In general, how happy would you say that you are-very happy, fairly happy, or not very happy?" And, on the other hand, the Cantril (1965) "Self-Anchoring Striving Scale," familiarly known as Cantril ladder, which asks respondents to place themselves in a ten-step ladder which top step represents the best possible life they imagine for themselves (in which they would be happy) and the bottom of the ladder represents the worst possible life.

In fact, psychological accounts of well-being were not alien to economics. Thus, the concept of utility was for a long time linked to the experience of pleasure, and economics to the calculus of pleasures and pain (Bentham, 1954). Subsequently, the concept of utility expanded and was more broadly interpreted as preference satisfaction, attending to the fact that individuals do not only care about their hedonic subjective states but may have other motivations.[2]

However, the profession was stuck to an objectivistic approach to well-being where utility was inferred from observables such as consumption and leisure. According to the old interpretation of utility, the higher the level of income the more the amusements and pleasures people enjoy, whereas nowadays a higher level of income is interpreted as a higher capacity of individuals to fulfil their preferences. Subjective experiences were deemed unscientific because they were not objectively observable (Frey & Stutzer, 2002). Dissenting from this view, Easterlin argued the

[2]Mainstream economics partly abandoned its psychological foundations along the 1930s pushed by the ordinal and revealed preference revolutions: the former rejected the notion of cardinal utility, and the latter the notion of utility as a mental state altogether because, contrary to actual choices, it lacks observational underpinnings (D. Hands, 2010). According to this approach the cardinality and interpersonal comparisons of utility had no sound empirical basis. However, it must be noted that thereafter the utilitarian account of well-being, now interpreted as preference satisfaction, has continued to be the standard (Bruni, 2004; D. Hands, 2010) based on the assumption that people have the same preferences and make the same choices in similar circumstances –thus they have the same utility function– (Sen, 2000).

following:

> One may attempt to use "objective" indexes such as consumption, nutrition, or life expectancy to infer happiness. Or one may seek to gauge well-being from various behavioral indicators, for example, measures of the prevalence of social disorganization (delinquency, suicide, and so forth). Ultimately, however, the relevance of such measures rests on an assumed connection between external manifestations and internal states of mind—in effect, on a model of human psychology. (Easterlin, 1974, p. 117)

Unconnected to the economists' concerns, some public opinion researchers and social psychologists had developed two simple measures that could arguably serve as proxies for total utility understood as preference satisfaction given that they entail a valuation process that is not reducible to a hedonic balance but may take into account more general goals.[3] Thereafter, psychologists have continued improving the conceptualization and measurement of subjective well-being.

1.2 Subjective well-being: concept and measurement

In psychology the concept of utility is replaced by subjective well-being, which encompasses two kinds of mental phenomena: affects and cognitive evaluations. Table 1.1 shows the main components of subjective well-being that we discuss in what follows.

Affects consist mainly of moods and emotions, which constitute non-reflective evaluations of life circumstances and events. They can be positive (pleasant) or negative (unpleasant). Mood states are characterized by their persistence and their loose connection to particular events, whereas affective states (a variety of pleasures and pains, and transient emotional states) are more closely related to current sit-

[3]Today it is widely accepted that there is sufficient regularity in human psychology so that interpersonal comparisons appear feasible in principle (Fleurbaey et al., 2009). On the value of subjective well-being measures as proxies for utility see, for instance, Frey and Stutzer (2002). On the other hand, some authors point to the need of distinguishing between the concepts of subjective well-being and utility as they find some systematic discrepancies between elicited choices in hypothetical scenarios, on the one hand, and predictions about the subjective well-being consequences of such hypothetical scenarios, on the other (Benjamin et al., 2012). They identify as additional or alternative motivations for people's predicted choices the following factors: sense of purpose, control over one's life, family happiness, and social status. To a large extent these are precisely the caveats raised by some psychologists regarding the subjective well-being approach to psychological well-being, which are discussed below.

Table 1.1: Main components of subjective well-being or happiness

Affective well-being		**Cognitive well-being**			
Positive affect	Negative affect	Life domain evaluations	Overall life evaluation		
			General happiness	life satisfaction	Cantril-ladder-type life evaluations

Source: Author.

uations (Kahneman et al., 1999).[4] Examples of pleasant affects are the feelings of happiness, warm, and enjoyment. On the other hand, some unpleasant affects are the feelings of pain, worry, sadness, anger, and depression.

Researchers are concerned about the amount of time people spend in a pleasant as opposed to an unpleasant affective state and the association between certain activities and affective well-being (Kahneman, 1999; Kahneman & Krueger, 2006). At the aggregate level researchers focus on the proportion of individuals that have experienced significantly a given emotion recently (or on the average of an index that combines several emotions) and its relationship with certain life conditions (Deaton & Stone, 2013; Helliwell & Wang, 2013; Layard et al., 2012). On-line or moment-to-moment self-reported measures of affective states have been validated testing their convergence with measures of the cortisol levels of the respondents, a variable linked to positive functioning (Kahneman & Krueger, 2006), whereas measures of remembered affects have been shown to correlate as predicted with future behaviour (Wirtz et al., 2003) and personality traits: neuroticism emerges strongly correlated with unpleasant affect, whereas extraversion, is moderately correlated with pleasant affect (E. Diener & Lucas, 1999).

Interestingly, the distinction between positive and negative affects is supported, at the biochemical level, by the fact that pleasure and pain appear to be mediated by different neurotransmitters (Kahneman et al., 1999). Regarding self-reported affects, evidence shows that positive and negative affects have different correlates and, in general, positive affect is more easily explained by life circumstances than negative affect (Helliwell & Wang, 2013; Layard et al., 2012). Moreover, Helliwell et al. (2019) show the different trajectories of positive affect and negative affect in the world in recent years: whereas positive affect shows no significant trend between 2006 and 2018, negative affect shows a significant upward trend starting in 2010.

On the other hand, cognitive evaluations are reflective judgements that entail a cognitive process in which individuals compare aspects of their life, or their life

[4]Rojas (2017) distinguishes as a particular affective state, distinct from emotions, the pleasurable and unpleasurable feelings produced by the activation of the senses.

as a whole, with certain standards of evaluation, basically their aspirations, past experience, expectations of the future, and other people's achievements (Frey & Stutzer, 2002). The cognitive component of subjective well-being is very much related to the achievements and failures resulting from the pursue of personal goals (Rojas, 2009). Hence, in general, cognitive evaluations do not merely reflect the affect balance experienced during a relevant period, although emotional experiences are an important aspect considered in such evaluations (Schimmack et al., 2002).

One distinct and particularly relevant cognitive evaluation is the one that concerns one's life as a whole: a global appraisal that takes into account all aspects of a person's life (E. Diener, 1984; OECD, 2013). The global appraisal may be referred to as either general happiness, life satisfaction, or life evaluation depending on whether the appraisal is carried out in terms of happiness, life satisfaction or a Cantril ladder, respectively (Helliwell & Wang, 2012). In particular, life satisfaction is usually conceptualized as a synthesis, according to some specific criteria, of the levels of satisfaction with specific life domains (E. Diener, 1984; Easterlin & Sawangfa, 2007; van Praag et al., 2003), such as work or main activity, family, leisure, health, finances, housing, social relationships, community, and environment (Cummins, 1996; E. Diener et al., 1999; Rojas, 2006; Schimmack et al., 2002).

Global assessments are thought to be carried out naturally by human beings as part of the decision making process, especially when facing important decisions. In this regard, subjective well-being and ill-being arguably fulfil important evolutionary functions (Rojas, 2009). Affective reactions are signals that allow sensitive living beings to adapt behaviour and thus enlarge survival probabilities. Reasoning capacity enables humans to improve the quality of that survival in the form of well-being (Damasio, 2010; Heylighen & Bernheim, 2000; Veenhoven, 2005).

In this thesis we do extensive use of the measure of life satisfaction included in the World Values Survey, whose respondents are asked: "All things considered, how satisfied are you with your life as a whole these days? Using this card on which 1 means you are 'completely dissatisfied' and 10 means you are 'completely satisfied' where would you put your satisfaction with your life as a whole?"[5]

Importantly, individuals are familiarized with the notion of life satisfaction and have little trouble answering questions about it (E. Diener, 1984; Inglehart et al.,

[5]There is an influential multi-item measure of life satisfaction, the Satisfaction With Life Scale (SWLS) (E. Diener et al., 1985). The SWLS is calculated as the sum of the scores on five particular items: 1) "In most ways my life is close to my ideal;" 2) "The conditions of my life are excellent;" 3) "I am satisfied with my life;" 4) "So far I have gotten the important things I want in life;" and 5) "If I could live my life over, I would change almost nothing;" which are assessed based on a response scale with seven categories that range from 1 (strongly disagree) to 7 (strongly agree). Thus, the values of the SWLS range from 5 (low satisfaction) to 35 (high satisfaction).

2008; Kahneman & Krueger, 2006). Moreover, the high test-retest correlations found suggest that measures of life satisfaction are not dramatically affected by contextual factors or occasion-specific moods but they reflect a substantive phenomenon (Eid & Diener, 2004). Besides, Cheung and Lucas (2014) have shown that single-item life satisfaction scales are valid compared with longer multi-item scales.

Life satisfaction measures have been extensively validated showing that they correlate as predicted with reports of outside observers such as family members, friends, and professionals; the number of positive vs. negative memories people recall; the quality of sleep; and different measures of psychological well-being: self-esteem, optimism, self-efficacy, and depression. Moreover, life satisfaction measures have been shown to correlate as expected with certain physiological variables (heart rate and blood pressure) and brain activity (left-right difference in prefrontal cortex activation). Finally, life satisfaction measures have been found to predict outcomes such as catching a cold, time taken to recover from a health condition, quitting one's job, exiting from marriage, voting for incumbents, and living longer (E. Diener & Lucas, 1999; E. Diener & Suh, 1999; Kahneman & Krueger, 2006; Krueger & Stone, 2014; Layard, 2010; Stone & Krueger, 2018). Otherwise, life satisfaction measures correlate as predicted with life circumstances that are plausible causes of well-being, such as personal income, employment status, physical health, and family status (Kahneman & Krueger, 2006; Krueger & Stone, 2014; Layard, 2010; Stone & Krueger, 2018).

Regarding discriminant validity, measures gauging overall life evaluations are much less responsive to short-lived events that exert transitory effects on individuals than measures of short-term affect, and, on the other hand, more affected by major life circumstances (Eid & Diener, 2004). Thus, Helliwell and Wang (2012) discussing the sources of affective well-being, point out that, as compared with life evaluations, "the effects of income are much smaller, and often statistically insignificant" (p. 15). Deaton and Stone (2013) note that "hedonic measures are uncorrelated with education, vary over the days of the week, improve with age, and respond to income only up to a threshold," whereas "evaluative measures remain correlated with income even at high levels of income, are strongly correlated with education, are often U-shaped in age, and do not vary over the days of the week" (p. 592). At the cross-country level, average negative affect is uncorrelated with GDP per capita (Layard et al., 2012) and the positive correlation between the latter and average positive affect seems to be driven by few extreme cases at the top and the bottom of the distribution (Deaton & Stone, 2013), and the correlation becomes statistically insignificant once controlling for social support and sense of freedom (Layard et al.,

2012).

Interestingly, regarding the three different types of overall life evaluation, evidence suggests that reports of general happiness rely more on affective well-being than reports of life satisfaction, which in turn do it more than life evaluations based on the Cantril ladder, which are successively more focused on the comparison between one's objective life circumstances and standards of evaluation. In this regard, these measures show different average values as predicted, thus, when comparable data is available, it is found that people report on average higher general happiness than life satisfaction, which in turn emerges higher than the Cantril ladder score (Helliwell & Wang, 2012).[6] On the other hand, apparently, the three equations present the same structure, thus "tests of explanatory equations show that the same variables explain happiness and life satisfaction, with generally similar coefficients, including the effects of income ... The same is true for life satisfaction and ladder responses" (Helliwell & Wang, 2012, p. 14).

We conclude this section pointing out some potential sources of systematic measurement errors that may affect inferences based on life satisfaction data, especially when the former affect differently individuals and social groups (or countries in our particular case). Firstly, the social desirability response bias occurs when individuals report a given level of subjective well-being, not because that is their true state, but because they believe that it is socially desirable to be in that state (E. Diener et al., 1991). In fact, social desirability correlates with subjective well-being: people sometimes report higher subjective well-being when interviewed in a face-to-face survey rather than in an anonymous interview, thus it is desirable that all respondents in a survey be interviewed using the same method (E. Diener et al., 2013). Secondly, the response style bias occurs when there is a tendency to select some particular response option independently of the item content. In the case of life satisfaction measures researchers are especially concerned with the either-extreme-or-midpoint category response bias, though E. Diener et al. (2013) conclude that "number use can be a concern, but often seems to produce small differences" (p. 516). Third, it is crucial to have comparable data that the wording of both the questions and response categories are the same across individuals and along time (Easterlin, 2017; Stevenson & Wolfers, 2008). Fourth, the question order exert also an effect on reported happiness. For instance, asking about finances or politics before asking

[6]The fact that affective well-being is less dependant on objective life circumstances, and in particular on income, makes it likely that both individuals and countries present less variation in terms of affective well-being than in terms of life evaluations, which is exactly the case (E. Diener et al., 2018; Helliwell & Wang, 2012). The limited variation in terms of affective well-being makes that most people across the world experience positive or pleasant emotions more than negative or unpleasant ones (E. Diener et al., 2018).

about overall life satisfaction tends to depress the overall life evaluation because, in general, satisfaction in those domains is substantially lower than the overall life satisfaction and by making them more salient the overall life evaluation gets significantly reduced (Easterlin, 2017; Stevenson & Wolfers, 2008). On the contrary, if overall life evaluation questions are preceded by questions about friends, family, and leisure the overall life evaluation may be inflated (Stevenson & Wolfers, 2008). Finally, contextual factors also affect happiness reports, thus Stevenson and Wolfers (2008) note that these data show significant day-of-week and seasonal cycles as well. Importantly, most contextual factors effects cancel out at the aggregate level, although some of them may affect most of the population, such as a major victory of the national soccer team (Schwarz et al., 1987).

1.3 Index of average life satisfaction in a country

The aggregation of life satisfaction data into an index of well-being in a country requires the data to be interpersonally comparable. Based on the extensive evidence supporting the validity of the data on life satisfaction, there are seemingly "good reasons to trust the existence of sufficient regularity in human psychology, so that interpersonal comparisons appear feasible in principle" (Fleurbaey et al., 2009, p. 2). Overall life evaluations are mostly reported using ordinal scales that include between 3 and 11 response categories, and, as was previously noted, reported measures converge with reports of external observers. In this regard, individuals have been found to be "somewhat able to recognise and predict the satisfaction level of others" and "to translate verbal labels, such as 'very good' and 'very bad', into roughly the same numerical values" (Ferrer-i-Carbonell & Frijters, 2004, p. 644). Thus, individuals seemingly share a common idea of what life satisfaction is and use a common reporting function (Ferrer-i-Carbonell & Frijters, 2004). Layard (2010) argues that otherwise "human society would find it hard to function" (p. 534).

Moreover, it seems that individuals interpret questions on life satisfaction in a cardinal sense and response categories as evenly spaced. This implies, for example, that the difference in satisfaction between a 2 and a 3 for any individual is the same as between a 6 and a 7 for any other individual (Ferrer-i-Carbonell & Frijters, 2004). Actually, 10 and 11-point numerical scales are explicitly designed as discrete interval scales and are particularly well-suited to be treated cardinally (Pugno & Sarracino, 2019; Stevenson & Wolfers, 2008). Ferrer-i-Carbonell and Frijters (2004) found that treating data as cardinal (equal-interval) or ordinal made little difference in estimating the determinants of subjective well-being.

Indices of well-being in a country based on data on overall life evaluations are commonly computed as the simple average of the individual-level values, thus assuming an interval scale. According to Stevenson and Wolfers (2008) this approach "may make more sense when analyzing questions that ask respondents to give a cardinal response (such as the World Values Survey life satisfaction question, which asks for a response on a scale of 1 to 10)" (pp. 76-77).

Stevenson and Wolfers (2008) computed five alternative estimates of average life satisfaction based on five different cardinalization approaches and found that all of them yielded highly correlated well-being aggregates. In particular, they used as estimates of average well-being the estimated country fixed effects using the following models: ordered probit (ordered probit index), ordered logit (ordered logit index), and heteroscedastic ordered probit (heteroscedastic ordered probit index).[7] Additionally, they used the percentage of individuals reporting a life satisfaction greater than 7 on a 1-to-10 scale and, finally, the simple mean.

Interpersonal comparisons within countries result in general rather uncontroversial nowadays. What about international comparisons? Blanchflower and Oswald (2008) note that many researchers are rather sceptical about the possibility of carrying out international comparisons of life satisfaction data:

> While the multi-country studies' findings are intriguing, commentators like Ostroot and Snyder (1985), Argyle (2001) and Kahneman and Riis (2005) point out that it is hard to know what to make of the cross-national claims. First, language differences raise the worry that words like 'life satisfaction' cannot be translated sufficiently consistently to ensure that the variations in reported well-being are meaningful. Second, cultural differences – in some countries it may be less acceptable to admit to unhappiness – further complicate inference. (Blanchflower & Oswald, 2008, p. 219)

However, some studies suggest that language translation is unlikely to have a large impact on the measures of subjective well-being (see references in E. Diener and Suh, 1999). Thus, "people across cultures clearly recognize emotions such as anger, sadness, and joy when displayed in others' facial expressions," suggesting that there is a "set of emotions that are universal to humans and appear in all cultures," and "studies have also found that when people around the globe are asked about what is required for more happiness or life satisfaction, the answers are strikingly uniform: money, health, and family are said to be the necessary components of a good life" (Stevenson & Wolfers, 2008, pp. 5–6).

[7] Importantly, it must be noted that under the assumption of an underlying symmetric distribution such as the normal and the logistic, the mean may be interpreted as the median, which is a centrality measure of a distribution that is independent of the scale (Chen et al., 2019).

Moreover, evidence suggests that cultural differences in the social norms concerning the experience and expression of emotions and satisfaction do not create much artefactual variability in subjective well-being. Thus, on the one hand, data suggests that differences in the desirability of subjective well-being or the familiarity with this phenomenon are not a relevant source of nation differences in reported subjective well-being (E. Diener & Suh, 1999; E. Diener, Suh, Smith, et al., 1995). And, on the other hand, there may be differences regarding moral beliefs about happiness, but "to parse these differences into artifactual response tendencies that are unrelated to true life satisfaction versus real differences in life satisfaction is challenging, in part because the response tendencies in part reflect differences in how people feel and think about the world and themselves" (E. Diener et al., 2013, p. 517).[8]

Certainly, though in general the life satisfaction equation show a common structure across countries and cultures, we may expect that there are significant differences in the role of some particular determinants (E. Diener & Diener, 1995; Schimmack et al., 2002), but this is not an issue in terms of the comparison of their indices of average (or median) life satisfaction. Finally, in some particular cases the number scale might be used differently across countries, although in the case of two important and very different countries such as China and the United States no relevant differences have been found (see references in E. Diener et al., 2013).

1.4 Happiness accounts of well-being: main concerns

The subjective happiness accounts of well-being are regarded too much restricted by some strands of the psychological well-being and quality of life literatures. Alternative accounts of well-being rely on more theoretical and objective grounds.

In psychology the eudaimonic well-being approach focuses on a number of positive psychological functionings, as opposed to decontextualized measures of subjective well-being. For instance, Ryff (1989), after reviewing multiple proposals from different fields of research (metal health, clinical, and life span developmental theories), focuses on six positive psychological functionings: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth. The sense of purpose in life has gained, in particular, much relevance recently.[9]

[8] We discuss this issue in more detail in a following section and in chapter 2.

[9] In this regard, the sense of meaning and purpose in life is sometimes included nowadays as a fourth dimension of subjective well-being, along with positive and negative affect and life

Ryff (1989) defines the sense of meaning and purpose in life as a sense of directness and intentionality, of being productive and creative, and ultimately achieving emotional integration in latter life: "one who functions positively has goals, intentions, and a sense of direction, all of which contribute to the feeling that life is meaningful" (p. 1071). Baumeister et al. (2013) assert that while affective well-being is rooted in nature and depends to some degree on whether basic (biological) needs are being satisfied, meaningfulness may depend on culture: "appraising the meaningfulness of one's life thus uses culturally transmitted symbols (via language) to evaluate one's life in relation to purposes, values, and other meanings that also are mostly learned from the culture. Meaning is thus more linked to one's cultural identity than is happiness" (p. 506).

Ryff (1989) provides evidence that suggests that the sense of purpose in life is far from being perfectly reflected by measures of affective well-being and overall life evaluations. Baumeister et al. (2013) find a number of diverging patterns between happiness as affect balance and the sense of meaning in life. First, satisfying one's needs and wants (e.g., being healthy, one's purchasing power, and feeling good) increases happiness but is largely irrelevant to meaningfulness. Second, happiness is largely present oriented, whereas meaningfulness involves thinking about future and the past. Third, meaningfulness, contrary to happiness, goes with being a giver rather than a taker. Fourth, higher levels of worry, stress, and anxiety are linked to higher meaningfulness but lower happiness. Finally, concerns with personal identity and expressing the self enhance meaning but not happiness.

In quality of life research subjective well-being indicators are deemed an insufficient informational base for quality of life assessments because the same collection of individual welfares may arguably go with very different social arrangements (Sen, 2016). In particular, Sen (2000) points out that the utilitarian approach neglects rights, freedoms and other non-utility concerns, which are valued by the happiness approach only indirectly and only to the extent they influence utilities. Moreover, it is argued that subjective well-being is prone to adaptation and mental conditioning. Additionally, average measures of subjective well-being neglect distributional concerns.

The phenomenon of happiness adaptation has been a central issue in happiness studies.[10] In a classic piece of research Brickman et al. (1978) found that short after experiencing the extreme life event lottery winners were not significantly happier

evaluations (Durand & Smith, 2013; Hicks, 2012; Stone & Krueger, 2018).

[10]An extreme version of the hypothesis of happiness adaptation is compatible with the thesis that happiness is almost completely genetically determined and it only departures temporally from its predetermined level due to external positive and negative shocks (Lykken & Tellegen, 1996).

than nonwinners and seriously disabled accident victims were already on average above the midpoint of the happiness scale. Riis et al. (2005) found further evidence on people's capacity to adapt to major health conditions. Thus, they observed that hemodialysis patients experienced not significantly different moods along the day and reported a not significantly different level of life satisfaction as compared with those in the control group. Regarding income, Di Tella et al. (2010) estimate that the extent of adaptation to an income change over the subsequent years is approximately 65%. The size of adaptation is sufficiently large that no significant income effect on happiness remains after the fourth year.

For the political relevance of subjective well-being indicators it is especially worrying that even more disadvantaged individuals manage to achieve positive mental states (Deaton, 2008; E. Diener & Diener, 1996). Sen (2000) points out that persistent negative mental states are unsustainable: "Our desires and pleasure-taking abilities adjust to circumstances, especially to make life bearable in adverse situations" (p. 62). E. Diener and Diener (1996) speculated that the normal subjective well-being level may be positive independently of the objective life conditions because positive mental states enhance "human sociability, drive-free exploration, and creativity, and produce a strong immune response to infections" (p. 184).[11]

However, it has been shown that extreme versions of the thesis of happiness adaptation are at odds with the evidence. In general, affective adaptation to chronic health conditions is not complete (D. Smith et al., 2005; Wu, 2001). Using a more reflective measure of subjective well-being: life satisfaction, Oswald and Powdthavee (2008) estimated that the extent of happiness adaptation to a moderate disability is approximately 50%, whereas adaptation to a severe disability is of the order of 30%. Adaptation to unemployment is not complete either (Clark, Diener, et al., 2008).

Apart from adaptation, the sensitivity of subjective well-being to many objective life circumstances depends on social norms. For instance, the effect of unemployment on mental health depends on the unemployment rate in one's reference group (Clark, 2003; Clark & Oswald, 1994). Thus, "unemployment always hurts, but it hurts less when there are more unemployed people around" (Clark, 2003, p. 346). Analogously, the happiness cost of obesity (an increasingly worrying health condition) is also mediated by social norms. The impact of overweight on happiness is much lower in socioeconomic groups (Graham & Felton, 2005) and places (Wadsworth & Pendergast, 2014) whose obesity rates are higher.

On the other hand, social comparisons are a source of variation in cognitive subjective well-being linked to interpersonal inequality in objective life circumstances.

[11] E. Diener et al. (2015) provide evidence in this regard.

It is well-established in this regard that despite the absolute value of income (the happiness gains derived from increased consumption) may eventually ware off, its relative value (as it concerns interpersonal comparisons) remains, as the consistent finding of a happiness-income gradient (in a given society at a given time) makes it apparent (Clark, Frijters, et al., 2008). Higher relative income means higher social status, and in general there seems not to be adaptation to status. Di Tella et al. (2010) use an occupational prestige scale as a proxy for social status and their estimations suggest that it has a permanent effect on cognitive life evaluations.

It must be noted moreover that the estimated effect of the occupational status on happiness may not only (not even mainly) gauge relative or positional concerns but also the fact that high status jobs are often also intrinsically interesting. In this regard, based on theories of basic psychological needs (e.g., Ryan and Deci, 2000), it is argued that both the extent of adaptation and the influence of social norms are larger for extrinsic aspects of life, such as income and social status, than for intrinsic aspects, such as social relationships or activities that provide autonomy and the experience of competence (Frey & Stutzer, 2006).[12] Similarly, Veenhoven (2005) states that life satisfaction lasting gains have nothing to do with the realisation of wants such as buying the latest TV set, but with the satisfaction of needs such as companionship. Easterlin (2005) argues that a better theory of well-being involve adaptation to income but not to events in the non-pecuniary domain.

In this regard, mounting evidence shows that positive relations with others are crucial for subjective well-being (E. Diener & Seligman, 2004) and it has been also found that the sense of purpose in life has a clear influence on life satisfaction, "independent of the roles of life circumstances and positive emotions" (Helliwell et al., 2019, p. 22). Thus, theory and evidence points to a certain convergence between the eudaimonic and (cognitive-based) hedonic approaches to psychological well-being. Helliwell et al. (2015) interpret the sense of meaning and purpose in life as an important support for subjective well-being, rather than a direct measure of it.

Recently, E. Diener et al. (2018) have revisited the paper "Most people are happy" (E. Diener & Diener, 1996) based on some new evidence. Overall, evidence shows that not everyone is reasonably happy independently of their objective life circumstances: "we found that under adverse conditions in which both social and material quality of life are bad, most people were not happy" (E. Diener et al.,

[12]Extrinsic aspects of life are those that are not valuable in their own right in terms of well-being: the value of income depends on the things you do with it and the value of social status depends on external factors. Intrinsic aspects of life are those that provide subjective well-being directly and without depending on external factors.

2018, p. 168). This is true for some specific groups (homeless, sex workers, institutionalized psychiatric patients) in more developed countries and for people from countries that are very poor and troubled. Interestingly, in line with previous findings they observe that most people across the globe experience positive or pleasant emotions more than negative or unpleasant ones, although, as noted above, this general pattern does not apply in cases of severe hardship. On the other hand, the cognitive component of subjective well-being emerges much more sensitive to life circumstances.[13] The authors argue that positive affects tend to depend more on the satisfaction of basic needs (e.g., social support) that societies, in general, address quite effectively, whereas cognitive evaluations depend on the comparison of one's life circumstances with standards that change to some degree with culture and expectancies. The authors conclude that "people obviously do not adapt to all circumstances, and practitioners and policy makers need to understand that societal and personal circumstances can have a significant influence on people's well-being" (E. Diener et al., 2018, p. 169).

In this regard, cross-country evidence provided by the World Happiness Report since 2012 has shown that there are large and long-lasting international differences in subjective well-being. Interestingly, in the World Happiness Report 2018 it was shown that there is an almost perfect correspondence between two different international happiness rankings concerning the happiness of the locally born and that of immigrants in the corresponding country, respectively. "The evidence from the happiness of immigrants and the locally born suggests strongly that the large international differences in average national happiness documented in this report depend primarily on the circumstances of life in each country" (Helliwell et al., 2019, p. 38).

More importantly, the issue of happiness adaptation is less problematic when dealing with sustained negative trends in happiness, such as those observed in the U.S. and China in recent years. In the U.S. happiness is following a downward trend since the 1970's, especially among women (Blanchflower & Oswald, 2004; Stevenson & Wolfers, 2008, 2009). Regretfully, unhappiness, pain, and opioid consumption seems to be becoming commonplace in the country (Blanchflower & Oswald, 2019; Krueger, 2017). Other countries which recent trends in subjective well-being are negative are Japan, Belgium, and Italy (Pugno & Sarracino, 2019; Stevenson & Wolfers, 2008). And negative trends in subjective well-being are not only a threat for rich Western countries: average life satisfaction substantially dropped in China during the period 1990-2007 (Bartolini & Sarracino, 2015) and the evolution is also negative in India (Easterlin, 2017).

[13]This fact is also discussed in Luhmann et al. (2012) and Deaton and Stone (2013).

Apart from the issue of happiness adaptation, another possible limitation of the happiness approach is the neglect of distributional aspects. However, it must be noted that currently most research on the phenomenon of subjective well-being at the country level provides disaggregated data and separate estimations by relevant social groups defined by gender, race, age, employment status, educational level, marital status, and region (e.g., Blanchflower and Oswald, 2004; Stevenson and Wolfers, 2008).

1.5 Happiness accounts of well-being: a flourishing radically person-centred approach

The happiness approach is appealing because it is radically person-centred. In this regard, Sen (2000) points out that its attention to the mental state consequences of social arrangements is a merit of this approach: disregarding consequences in general would be very misleading, and, in particular, attending to the subjective well-being consequences, "rather than looking only at some abstract and alienated characteristics of states of affairs" (p. 61), is an important merit. Rojas (2009) is very insightful regarding the aim of the happiness approach:

> The approach focuses on the well-being of a particular person, and not on the well-being of a given academician. It can be asserted that it studies the well-being of human beings of flesh and blood (à-la-Unamuno in *The tragic feeling of life*) who are embedded in their particular circumstances (à-la-Ortega y Gasset in *Meditations On Quixote*). (Rojas, 2009, p. 547)

Arguably, well-being crucially involves what people think and how they feel about their lives. In this regard, several authors assert that the happiness approach is a democratic approach to well-being because it leaves it to individuals to evaluate their own well-being (Clark et al., 2017). Although, on the other hand, given that subjective well-being is to some extent subject to adaptation, other authors consider that a truly democratic approach to well-being or advantage would attend to people's unconstrained or unconditioned preferences (Fleurbaey et al., 2009). In this regard, it is pointed out that someone may be genuinely satisfied with the life she is leading although she would choose or actually strives for a different kind of life. However, we have seen that, at least as population-based studies are concerned, cognitive subjective well-being is not fully subject to adaptation.

Overall, we can conclude that monitoring subjective well-being is necessary although not sufficient to inform a reasoned public discussion about the levels of

well-being in a given society (Brock, 1993; E. Diener, 2006; Sen, 1993, 2000).

The interest on subjective happiness and mental health is nowadays well-established in economics. Several Nobel laureate authors advocate research on subjective well-being (Kahneman & Krueger, 2006; Stiglitz et al., 2018; Stiglitz et al., 2009) and some other have carried out such research (Deaton, 2008; Deaton & Stone, 2013; Rayo & Becker, 2007). Moreover, major economic journals regularly publish research on happiness and mental health (Adhvaryu et al., 2019; Bertrand, 2013; Campante & Yanagizawa-Drott, 2015; Di Tella & MacCulloch, 2005; Levitt, 2020; Lindqvist et al., 2020; Luttmer, 2005; Perez-Truglia, 2020; Proto & Oswald, 2017). Otherwise, the strength of happiness studies has given rise to multiple specialized interdisciplinary academic journals: *Journal of Happiness Studies* (since 2000); *International Journal of Wellbeing* (since 2011); and *International Journal of Happiness and Development* (since 2012).

1.6 Sources of cross-country variation in average life satisfaction

We have already seen that the origin of the economics of happiness is strongly linked to the concern about the relationship between economic growth and the average person overall experience of life. Literature on this relationship has provided valuable insights about the sources of countries' average life evaluations and, moreover, about the complex interrelationships between such sources. We must pay attention to these two aspects as they are key as a theoretical background and motivation for our research.

The standard assumption in economics (and also among many lay persons) was (and to large extent still is) that the rise in the material living conditions of all members of a society may enhance the average level of happiness in that society. However, Easterlin (1974) found that in the United States, despite the huge economic growth observed between 1946 and 1970, there had been no gain in terms of happiness. Subsequently, Easterlin has documented similar profiles in other countries and accordingly has sustained that economic growth and overall happiness are unrelated in the long run (Easterlin, 2017).

Easterlin (1974) mentioned as one possible explanation for this finding the existence of a trade-off between income gains and other potential sources of subjective happiness (we would come back on this later), although he argued that what was thereafter known as the Easterlin paradox –the coexistence of a zero inter-temporal correlation between income and overall life evaluations, on the one hand, and the

positive gradient observed between both variables at a given point in time within a country, on the other– suggests that, regarding material living conditions, relative income, as opposed to absolute income, is the only argument in the utility function in the long run.

In principle, the Easterlin paradox is expected to be linked to a third stylized fact: a zero correlation between income and life evaluations at the cross-country level, or, at least, a significantly lower correlation between both variables at the aggregate level than at the individual level, given that the comparison income is likely determined within countries (Deaton & Stone, 2013; Easterlin, 1974; Stevenson & Wolfers, 2008). According to Easterlin (2003) the long-lasting sources of societal well-being are others, mainly family life, health, friendship, employment status, and work.

However, Stevenson and Wolfers (2008) find that the relationship between income and overall life evaluations across countries is approximately the same than within them at a given point in time. Deaton and Stone (2013), who actually find a larger association using aggregated data than using individual-level data, point out that the average level of income may gauge positive externalities or inform about people's permanent income, contrary to the thesis of negative externalities due to social comparisons.[14] Otherwise, the cross-sectional evidence suggests that the relationship between income and subjective happiness is log-linear and therefore there is no income threshold beyond which income exerts no effect on subjective happiness (Deaton, 2008; Stevenson & Wolfers, 2008).[15]

Overall, on the one hand, the idea that improving the material living conditions of all members of a society may enhance the average level of happiness is pervasive, especially when initially there is scarcity and the increased production mostly covers the basic needs of food, clothing, and shelter. However, on the other hand, "there is something fundamentally plausible in the idea that the difference in happiness between primitiveman and us is not proportional to the differences in our incomes" (Di Tella & MacCulloch, 2008, p. 38).

In this regard, some evidence suggests that the strong international happiness-income gradient may be partly due to the fact that the comparison income is becom-

[14]Interestingly, the result using an affective measure of subjective well-being (happiness yesterday) "conform more closely to the relative income story." Thus, in this case the coefficient on log income declines steadily as the level of aggregation increases. Note however that "an alternative story is that hedonic happiness, unlike life evaluation, is more closely related to transitory than to permanent income. Aggregation over larger units annihilates an increasingly large share of transitory income and drives down the coefficient on income" (Deaton & Stone, 2013, p. 593).

[15]It must be noted also that no-satiation concerns only the cognitive dimension of subjective well-being because Kahneman and Deaton (2010) do find a satiation point for emotional well-being: holding constant the incomes of other people, positive affect becomes satiated with income around the level of $75,000.

ing international (Dolan et al., 2008). Alternatively, Proto and Rustichini (2013) argue that there may be time-invariant confounding factors inflating the relationship of interest. Possible omitted variables are the income distribution and the preferences concerning public good supply. Moreover, they consider possible systematic measurement errors discussed in the previous section.[16] Controlling for time-invariant factors and not imposing any particular functional form they find consistent evidence of a non-monotonic relationship between income and life satisfaction across country-years.

Proto and Rustichini (2013) interpret their finding as the effect of rising aspirations that eventually surpass people's realizations. Rapidly growing aspirations or materialistic values (given that they concern one's purchasing power or relative earnings) have been linked to certain institutional conditions, in particular the widening scope of the market. Thus, the monetization of a good or activity is thought to induce individuals to focus more on material aspects than they otherwise would (Frey & Stutzer, 2014). In this regard, it is pointed out that pay for performance schemes make the pecuniary aspect more salient in the work domain, whereas advertising has a similar effect in the area of consumption (Frey & Stutzer, 2014; Layard, 2006). Regarding the latter, Layard (2006) notes, for instance, that how a person perceives his or her position in the income distribution is negatively associated with the hours she watches TV (controlling for her actual income).

Moreover, in a context of growing income inequality, the positive effect of personal income gains may be surpassed by the negative effect of a worsening relative position. At the aggregate this may have a negative impact on average subjective well-being both because most people's incomes are below the average (the income distribution is right skewed) and due to the asymmetric effects of positive and negative differences with respect to the reference income –that has to do with human's higher sensitivity to losses than to gains– (Proto & Rustichini, 2013). The relative income effect has been found to play a role in the declines in subjective well-being in the United States and Italy (Bartolini et al., 2013; Blanchflower & Oswald, 2004; Pugno & Sarracino, 2019).

The relationship between income and life evaluations at the cross-country level may be further complicated by other factors apart from the relative income effect and rising materialistic values. Thus, the institutional and psychological foundations of economic growth may have a negative impact on other life domains crucial for subjective well-being. This issue was already illuminatingly exposed by Pigou

[16]Regarding possible omitted variables, Stevenson and Wolfers (2008) mention democracy, the quality of national laws or government, health, and even favourable weather conditions.

(1932), albeit he eventually asserted that such negative externalities were unlikely:

> The possibility of conflict between the effects of economic causes upon economic welfare and upon welfare in general ... is easily explained. The only aspects of conscious life which can, as a rule, be brought into relation with a money measure, and which, therefore, fall within economic welfare, are a certain limited group of *satisfactions* and *dissatisfactions*. But conscious life is a complex of many elements, and includes, not only these satisfactions and dissatisfactions, but also other satisfactions and dissatisfactions, and, along with them, cognitions, emotions and desires. Environmental causes operating to change economic satisfactions may, therefore, either in the same act or as a consequence of it, alter some of these other elements. (Pigou, 1932, p. 14)

Evidence from several countries suggests that "economic causes" are indeed exerting "in the same act" a negative effect on subjective well-being. Thus, recent declines in subjective well-being in the United States and Japan are seemingly explained in part by the worsening working conditions and increasing economic uncertainty underlying recent economic growth. Di Tella and MacCulloch (2008) argue that there is "increased anxiety and job insecurity caused by globalization, [and] stress at work" (p. 38) and, similarly, Stevenson and Wolfers (2008) point out that in the U.S. "along with this rise in income inequality has come concerns about increasing income volatility and a more general concern about increasing inequality stemming from households bearing more health and retirement risk" (p. S36).

Blanchflower and Oswald (2004) found that changes in the employment status composition of the population partly explain the evolution of happiness in the United States, with an increasing number of individuals out of the labour force, who have additionally suffered a larger decline in subjective well-being. Krueger (2017) provides updated evidence on the upward trend in the share of the population out of the labour force and show that individuals in this group are more likely to suffer pain and other physical and mental health conditions as compared with both employed and unemployed individuals, although their life evaluations are higher on average than those of unemployed individuals. Similarly, in Japan there was a surge in large scale unemployment starting in the 1990s (Stevenson & Wolfers, 2008).

On the potential negative consequences of certain "economic causes" or institutional conditions, a major concern is the impact of economic factors on social relationships and trust. In this regard, Bruni and Porta (2005) point out that, apart from the traditional positional externality concern, "some authors ... refer also to a second kind of externality that we can call 'relational externality': in this case, the externality problem is related to the interplay of different domains of one's

life: A's effort in the materialistic domain affects A's relational domains" (p. 14).[17] Layard (2006) takes as an example of institutional or environmental condition mobility policies and argue that "more mobility certainly increases income but it also affects the quality of relationships in the community and the families" (p. C32). In particular he considers that more mobility may likely produce less family stability and more crime.

In fact, the negative trend in average subjective well-being in the United States in recent decades is associated with a rise in the proportion of unmarried people (Blanchflower & Oswald, 2004), who are on average less happy than marrieds, arguably because they lack a key source of companionship and social support, especially in Western societies (Clark et al., 2017; E. Diener & Seligman, 2004). Moreover, Bartolini et al. (2013) show that the negative trend in subjective well-being in the United States is also associated with declines in social contacts (time spend with relatives, neighbours, or friends), social trust, civic group membership, and, to a lesser extent, confidence in institutions. Similarly, Pugno and Sarracino (2019) find that the strong drop in mean life satisfaction in Italy in recent years responds partly to a declining social trust.[18]

Otherwise, interestingly, in the United States the trend in subjective well-being is driven to a large extent by the experience of white women: the happiness of white men have remained stagnant, and the happiness of blacks have actually risen (Stevenson & Wolfers, 2009). Regarding highly educated women, it seems that they have not been able to "double up" the subjective well-being premiums associated with either having a family or a career, but, on the contrary, that the competing needs of these two domains have led them to achieve lower levels of subjective well-being (Bertrand, 2013). In this regard, it has been argued that the incorporation of women to the labour force has not been accompanied by a symmetric involvement of men in child-rearing and other household tasks. Besides, Stevenson and Wolfers (2009) point out that declines in family life, social cohesion, and economic security may have had a greater impact on women, if, for instance, they are more

[17]Similarly, Stutzer and Frey (2012) point out that "given the importance of social relations for human well-being, changes in their quality have been argued to drive long-term trends in people's reported subjective well-being ... To what extent the development of happiness over time has to be understood as an interaction between economic factors and aspects of social capital is so far an open issue" (p. 9).

[18]Pugno and Sarracino (2019) note that the economic causes underlying the economic growth during the 1990s may explain this decline, thus they point out that "the fiscal restriction put people in conditions of greater economic needs, while labour flexibilisation made needs satisfaction more uncertain. People thus experienced a dramatic reversal of the tendency to less income inequality ... People further experienced more competition in the labour market just when public safety net was weakened, thus challenging their trust in others" (p. 12).

risk averse than men. In particular, low educated women may have been severely hit by the increases in divorce and out-of-wedlock childbearing. Finally, one psychological mechanism –a change in the reference group– may have played a role: greater equality may have led more women to compare their outcomes to those of men around them making them worse off. Similarly, although concerning a different social group, Pugno and Sarracino (2019) find that in Italy there has been reversal in the effect of ageing, from positive to weakly negative, maybe as a consequence of "a more expensive health care system, higher exposure to risk of poverty, and/or higher social isolation" (p. 26).

Are the previous potential side effects of economic growth a threat only for the richest regions and countries? Actually, the experience of Italy contrasts with this hypothesis as both Italian GDP per capita and average life satisfaction levels are currently falling below those of other European core countries after a period successfully catching up (Pugno & Sarracino, 2019). Moreover, Bartolini and Sarracino (2015) study the "dark side" of Chinese economic boom: the decline in life satisfaction during 1990-2007 in that country. The authors conclude that three main factors predict the negative trend in life satisfaction in China: first, the erosion of social capital as measured by social trust, strength of norms of civic cooperation, and social participation; second, the relative income effect due to increased inequality; and third, the growing materialistic values that have led Chinese people to rely more on social comparisons and less on social capital and sense of freedom when evaluating their lives.

Using a sample of both developed and developing countries, Mikucka et al. (2017) have studied the conditions under which economic growth is compatible with subjective well-being over time. They find that economic growth improves subjective well-being when social trust increases and, in rich countries, when income inequality decreases or, at least, remains stable –this latter condition does not apply for developing countries in general, although we have seen that it has seemingly played a major role in China.

Apart from income, social relationships, and social trust, there are two other major life conditions that influence the distribution of happiness across countries: health and self-perceived freedom (Helliwell & Wang, 2013; Inglehart et al., 2008; Layard et al., 2012). Interestingly, findings in Inglehart et al. (2008) suggest that self-perceived freedom is mostly enhanced by income growth, increasing social tolerance (towards sexual orientation and gender equality) and democratization processes. However, the effect of democracy has failed to be significant in studies that include both developed and developing countries (Bjørnskov et al., 2008; Helliwell et al.,

2017).

Paradoxically, the level of religiosity of a country does not predict its average level of life satisfaction even after controlling for possible confounding factors (Deaton & Stone, 2013) –it is paradoxical because, contrary to what is found at the aggregate level, happiness studies have consistently found that within a given society religious people evaluate their lives higher than non-religious people, irrespective of their faith (Dolan et al., 2008).

Finally, culture plays a role in the distribution of happiness across countries. Firstly, countries with stronger individualistic values show higher levels of subjective well-being (E. Diener, Diener, & Diener, 1995). Individualism refers to the pre-eminence of personal goals and desires as opposed to those of the group, and is associated with the extent of individual freedom. Secondly, the norms concerning the experience and expression of emotions and satisfaction seemingly have a real effect on subjective well-being. Thus, countries where there is more acceptance of pleasant affects and less acceptance of unpleasant ones report higher levels of subjective well-being (E. Diener & Suh, 1999). Researchers are not generally concerned about the possibility of this factor introducing a cultural artefact in the indices of average subjective well-being, not even for East Asian countries, the leading example of countries showing relatively more acceptance of unpleasant emotions and relatively less acceptance of pleasant ones (E. Diener, Suh, Smith, et al., 1995; Ng, 2002). Thus, social desirability does not seem to affect their reported levels of subjective well-being significantly (E. Diener, Suh, Smith, et al., 1995). It seems more likely that social norms concerning the experience and expression of emotions actually "reflect differences in how people feel and think about the world and themselves" (E. Diener et al., 2013, p. 517).

1.7 This thesis

1.7.1 General background

The World Happiness Report studies annually the state of subjective well-being in the world. Helliwell and colleagues analyse the distribution of overall life evaluations, positive affect, and negative affect in more than 150 countries using data from the Gallup World Poll. Trying to explain the distribution of average life evaluations across countries and years, Helliwell and Wang (2013) established a model that includes six factors: GDP per capita, health, social support, freedom, generosity, and corruption. This parsimonious and influential model explains around three-quarters of the variation in average life evaluations across countries and years. And

around half of such explained variation is due to the four social factors included in the model: social support, freedom, generosity, and corruption (the latter a proxy for social trust and good governance), which are jointly referred to as the social foundations of happiness (Helliwell et al., 2017).

Helliwell and Wang (2013) model assumes that there is a universal happiness equation, and, in light of multiple evidence, their model seemingly captures truly universal relationships between the six factors considered and average life evaluations. However, despite the success of the model in explaining variation in average life evaluations and the fact that there is evidence that shows that the structure of the happiness equation is rather homogeneous across countries, there are three facts concerning the world distribution of average life evaluations that should be noted.

First, there are significant differences regarding the importance of the different determinants of life satisfaction across countries (E. Diener & Diener, 1995; Schimmack et al., 2002). For instance, there is a stronger relationship between income and life satisfaction in less economically developed countries, whereas the sense of freedom is more important in more economically developed countries (Inglehart et al., 2008).

Second, there are complex interrelations between the different factors included in the equation. In this regard, in the previous section we discussed theory and evidence on possible trade-offs between income growth and other sources of happiness, such as family life (higher marital breakdown rates) and social relationships (less time spent with family members and friends, and also lower social participation), which are key sources of social support and sociality (Bartolini et al., 2013; Bartolini & Sarracino, 2015; Blanchflower & Oswald, 2004). Moreover, economic growth has been linked in some countries to worse community and larger society circumstances (lower level of interpersonal trust and confidence in institutions) (Bartolini et al., 2013; Bartolini & Sarracino, 2015; Mikucka et al., 2017; Pugno & Sarracino, 2019).

Regarding the social foundations of happiness, it is thought that certain mechanisms may enhance some social aspects at the expense of others. It is rather common the concern about the possible existence of trade-offs between social support and individual freedom (E. Diener, Diener, & Diener, 1995; Helliwell et al., 2017; OECD, 2001). In this regard, it has been found that family ties, which are associated with one of the main sources of social support, are negatively correlated with individual freedom (Alesina & Giuliano, 2010). On the other hand, friendship ties are associated with bridging attitudes (Pugno & Verme, 2012), which are more likely to enhance individual freedom. More generally, it is rather likely that there are strong and complex interrelationships between the different social factors.

Third, there is an important factor left in the error term of Helliwell and Wang (2013) model: culture, which, on the one hand, is associated with average life evaluations. Thus, individualistic societies –where the goals and desires of individuals have priority over those of the group– show higher levels of individual freedom and subjective well-being (E. Diener, Diener, & Diener, 1995). Moreover, those countries where social norms are more favourable to the experience and expression of emotions and satisfaction also present higher levels of subjective well-being (E. Diener & Suh, 1999). On the other hand, culture may likely play a role in the interrelation of the rest of determinants.

It is also remarkable the aggregate religion paradox. Thus, at the individual level it has been consistently found a positive relationship between religiosity and life evaluations. Religiosity, which is the expression of religion by individuals, encompasses two major aspects: a social aspect that mainly consists in the attendance at religious services, and a personal aspect associated with religious beliefs and values, and private religious practices (Helliwell, 2003). Religiosity may enhance subjective well-being through three different channels: on the one hand, religious beliefs and values may confer a sense of meaning and purpose in life to believers (E. Diener et al., 2011) and, moreover, they may promote health and well-being enhancing behaviours (Deaton & Stone, 2013; McCullough & Willoughby, 2009). On the other hand, the social component of religions may facilitate social integration by enhancing strong family and friendship ties (E. Diener et al., 2011; Lim & Putnam, 2010) and giving access to formal social support networks that provide both material resources (Deaton & Stone, 2013) and a positive social identity (Hayward & Elliott, 2014). In light of evidence at the individual level we may expect to find a positive association between the levels of religiosity and life evaluations at the cross-country level. But this has not been the case, not even after accounting for several potential confounding factors: income, health, personal security and effective public services (Deaton & Stone, 2013).

1.7.2 Specific goals

In light of previous arguments, we take on three specific goals in this thesis:

1. Systematic identification and complete characterization of groups of similar countries in terms of the joint distribution of average life satisfaction and its determinants.

2. Systematic identification and complete characterization of groups of similar

countries in terms of the joint distribution of the social foundations of happiness.

3. To shed light on the aggregate religion puzzle studying the relationship between religiosity and life satisfaction at the cross-country level.

1.7.3 Hypotheses and theoretical framework

We may not posit concrete hypothesis regarding the first two goals of the thesis because they are exploratory by nature, but we may discuss some associated results that may be useful in order to interpret our own results.

Regarding the possibility of distinguishing groups of countries with different life satisfaction patterns, previous literature has identified five groups of countries using approaches linked to regression analysis (basically the inclusion of regional fixed effects or, otherwise, the analysis of the residuals of the model by region): Latin American and the Caribbean (Helliwell, 2003; Helliwell & Wang, 2013; Inglehart et al., 2008), Confucian countries from East and Southeast Asia (Helliwell & Wang, 2013; Ng, 2002), ex-communist countries or economies in transition (Bjørnskov et al., 2008; Helliwell, 2003; Inglehart et al., 2008), North America, Australia, and New Zealand (Helliwell & Wang, 2013), and Scandinavia (Helliwell, 2003).

Countries from Latin America and the Caribbean show higher levels of subjective well-being than those predicted by their circumstances. Previous literature argues that they show high levels of social support and sociality, social aspects that seem to be moreover regarded as more important in these countries (Beytía, 2016; Rojas, 2018), and high levels of sense of freedom (Inglehart et al., 2008). Besides, it is pointed out that there is a strong tendency to see pleasant emotions and life satisfaction as desirable and unpleasant emotions as undesirable (E. Diener & Suh, 1999).

On the other hand, in Confucian countries from East and Southeast Asia, which show lower levels of subjective well-being than those predicted by their circumstances, there is more acceptance of unpleasant emotions and relatively less acceptance of pleasant ones, and in China neutrality is considered the ideal level of life satisfaction –neither satisfied, nor dissatisfied– (E. Diener & Suh, 1999). Additionally, Ng (2002) points out that East-Asian culture is "over-emphatic on conformity, order, and the collective interests to the detriment of individualism, freedom, and hence happiness" (p. 57).

Regarding the ex-communist countries, which also show lower levels of subjective well-being than those expected, it has been pointed out that the collapse of their

political and economic systems generated a long period of instability which effects are not fully captured by standard indicators (Bjørnskov et al., 2008). However, it must be noted that this group is not completely homogeneous. Thus, countries from Central and Eastern Europe were already distinguishable in the 90s (Helliwell, 2003) and more recently also the former Soviet republics of Central Asia (Guriev & Melnikov, 2018), which are seemingly performing better than other members of the Commonwealth of Independent States in several dimensions.

Finally, countries from both Scandinavia (Helliwell, 2003) and North America, Australia, and New Zealand (NAANZ) (Helliwell & Wang, 2013) show, on average, higher mean life evaluations than those predicted by their circumstances. Scandinavian countries stand out because they show higher values for most of the life evaluation determinants than other OECD countries. Regarding NAANZ, it is pointed out that in these countries there are strong norms encouraging the experience and expression of positive emotions and satisfaction with life (E. Diener & Suh, 1999; E. Diener, Suh, Smith, et al., 1995).

Regarding the possibility of distinguishing groups of countries with different patterns in the social foundations of happiness, previous research has noted the possible trade-offs between social support and individual freedom (E. Diener, Diener, & Diener, 1995; Helliwell et al., 2017; OECD, 2001). In this regard, it has been found that family ties, one of the main sources of social support, are negatively associated with individual freedom (Alesina & Giuliano, 2010). On the other hand, friendship ties are associated with bridging attitudes (Pugno & Verme, 2012), which may likely enhance individual freedom. Moreover, previous literature has characterized some groups of countries attending to certain social aspects. Thus, countries from Latin America are characterized as countries with high levels of social support and sociality, on the one hand, and problems at the community and the larger society level (delinquency, violence, corruption, etc.), on the other (Rojas, 2018). Moreover, Confucianism is a collectivistic culture, thus is expected to be negatively associated with individual freedom and positively associated with the level of social support (E. Diener, Diener, & Diener, 1995).

Finally, regarding the research on the relationship between religiosity and life satisfaction at the aggregate level, based on the self-determination theory (Ryan & Deci, 2000) we posit the hypothesis that the prevalent regulation style or type of motivation underlying the observance of religious prescriptions may be confounding the relationship of interest and that once accounting for them we may observe a positive relationship between both variables.

The self-determination theory establishes that the impact of a given social in-

stitution on well-being depends on the prevalent type of regulation of behaviour. Thus, in the case of religion, individuals may observe religious prescriptions, on the one hand, forced by an external authority, or trying to attain external recognition or to avoid feelings of guilt or anxiety. On the other hand, it may respond to the acceptance by individuals of such religious prescriptions that may have been even integrated with other values and needs. In the latter case individuals practise religion autonomously, whereas in the former case individuals practise religion heteronomously. Both types of regulation enhance the levels of religiosity, but only autonomous religiosity has a positive impact on subjective well-being (Ryan et al., 1993).

Moreover, there is evidence that suggests that out of the two aspects of religiosity (the social and personal aspects) the only one relevant for life satisfaction is the social aspect (Graham & Crown, 2014; Lim & Putnam, 2010). Accordingly, we establish this expected relationship as an additional hypothesis.

1.7.4 Data

The main sources of data in this thesis are the World Values Survey (WVS, 2015) and the European Values Study (EVS, 2015), which collect data on subjective well-being and its main determinants since 1981 (six and four rounds respectively) for representative samples of 109 countries around the globe. Based on data from these surveys and previous research we construct aggregate indicators of the following factors: life satisfaction, health (average self-reported health), social ties (average importance attributed to the family and friends), collective social capital (average levels of interpersonal trust and confidence in institutions), individual freedom (sense of freedom and tolerance of outgroups), religiosity (average importance attributed to God and average frequency of attendance at religious services), and religious motivation (percentage of people that consider religious faith an important quality children must be encouraged to learn at home –*chfaith*– and percentage that believe in hell –*hell*). When dealing with the social foundations of happiness we distinguish between traditional family ties (average importance attributed to the family, percentage of individuals that consider that parents should be loved and respected regardless of their qualities and faults, percentage that believe that parents should do their best for their children even at the expense of their own well-being, and percentage that have as one of their main goals in life to make their parents proud) and friendship ties (average importance attributed to friends). Moreover, we use a measure of social support and a measure of generosity drawn from the World Happiness Report (Helliwell et al., 2019), which uses data from the Gallup World Poll.

Data on GDP per capita is drawn from the World Development Indicators of the World Bank.

1.7.5 Empirical strategy

We use cluster analysis trying to identify groups of countries with distinct patterns in their levels of life satisfaction and its determinants. Cluster analysis is a set of numerical techniques that are suitable for classifying a sample of heterogeneous countries in a limited number of groups, each of which is internally homogeneous in terms of the similarities between the countries that comprise it. Moreover, countries from one cluster are different in some respects from countries in other clusters (Everitt et al., 2011). Interestingly, this method classify countries systematically and allows to fully characterize the resulting groups and identify their main features. Besides, the classification makes it easier the interpretation of the data of the different countries. Importantly, cluster analysis includes criteria to determine the appropriate number of groups in which to divide the sample of countries.

Regarding the relationship between religiosity and life satisfaction at the cross-country level, we first discuss our novel interpretation of *chfaith* and *hell*, and then we extend Helliwell and Wang (2013) model including controls for both the average level of religiosity and the prevalent type of regulation or motivation. The model includes, additionally, regional and year fixed effects. Units of analysis are country-years. We estimate a weighed pooled ordinary least squares model to account for the fact that the panel is unbalanced. We estimate robust standard errors clustered by country. The estimations are subjected to a wide variety of robustness checks using alternative indicators for each of the factors. Moreover we carry out a thoroughly discussion of the endogeneity issues that may affect our results exploiting the panel nature of the data.

1.7.6 Main results

In the thesis, after thoroughly discussing the main sources of cross-country variation in average life evaluations, we carry out a cluster analysis using as clustering variables average life satisfaction and five well-established determinants: average income, health, social ties, collective social capital, and freedom. We identify five groups of countries with distinct characteristics. One cluster comprises all European ex-communist countries (but those from the Balkans) and is characterized by showing low average levels in all the variables. Another cluster includes countries form Scandinavia and the Anglosphere (UK, Ireland, US, Canada, Australia, and

New Zealand) along with other countries scattered across the world. This group shows the highest average levels in all the variables. A third cluster comprises mainly countries from Western (continental) Europe and East and Southeast Asia (and also countries such as South Africa and Iran). This cluster is characterized by its high average levels of income and collective social capital, and, on the other hand, relatively low average levels of social ties and sense of freedom, as compared with the previous cluster. This cluster shows a moderately high average level of life satisfaction. Another cluster comprises most countries from Latin America and is characterized by its high average levels of self-perceived freedom, social ties, and life satisfaction. Finally, there is another cluster that consists of countries from North and East Africa, the Balkans, Middle East, and South Asia that shows a high average level of social ties, on the one hand, and low average levels of income, sense of freedom and life satisfaction, on the other.

This preliminary life satisfaction taxonomy of countries is robust to the clustering method. Besides, the taxonomy is in general consistent with the groups identified by previous literature, but it shows some worth noting deviations. First, the taxonomy suggests that the group of ex-communist countries should be broken down into more homogeneous groups. In particular, it shows that countries from the Balkans, Caucasus, and Central Asia are very different from those from Central and Eastern Europe and the European side of the Commonwealth of Independent States (CIS), which, moreover, consistently with Helliwell (2003), are found somewhat different from each other. The classification seemingly reflects the changes taking place in this group of countries in recent decades (Guriev & Melnikov, 2018). Second, regarding Confucian countries, the taxonomy suggests that Singapore, Korea, and Japan are to a certain extent more similar to countries from other regions, such as Western (continental) Europe, than to China, Honk Kong, and Vietnam, which, as compared with the former, show higher levels of collective social capital and lower levels of social ties. And third, the taxonomy suggests that there are some relevant deviant countries in the otherwise compact group of Latin American countries: Peru (included in the same group than the European ex-communist countries), Uruguay (clustered along with the countries from Scandinavia and the Anglosphere), and Chile (included in the group that comprises mainly countries from Western Europe and East-Southeast Confucian Asia).

Subsequently, after thoroughly discussing the concept and main indicators of the social foundations of happiness, we carry out a cluster analysis over six indicators of the social context: social support, family ties, friendship ties, tolerance of outgroups, generosity, and collective social capital, to group similar countries together and

characterize them. We identify four country groups and propose a country typology based on three major social characteristics: the levels of social support, individual freedom (as measured by the indicator of social tolerance), and the level of social cohesion (as measured by the indicators of collective social capital and generosity). In particular, the classification shows four types of countries: High-High-High type (HHH, high social support, individual freedom, and social cohesion), High-Medium-Low type (HML), Low-Low-Low type (LLL), and Low-Medium-High type (LMH).

HHH-type countries are concentrated in Western Europe and the Anglosphere and they show on average the highest level of life satisfaction, the highest proportion of very happy individuals, and the lowest proportion of unhappy ones. The countries that on average show relatively high levels of social support, intermediate levels of individual freedom, and low levels of social cohesion (HML-type countries) are concentrated in Ibero-America and Central and Eastern Europe. These countries show on average a moderately high level of life satisfaction, but on average they lie behind the rest of countries in terms of general happiness. The countries that on average show relatively low levels of social support, intermediate levels of individual freedom, and high levels of social cohesion (LMH-type countries) are most of them from Asia. These countries show, on average, a moderately high level of life satisfaction and also a relatively high proportion of very happy individuals and a low proportion of unhappy ones. Finally, LLL-type countries are most of them from Africa, the Balkans, Middle East, Caucasus, and Central Asia. These countries show on average the lowest level of life satisfaction, though it must be noted that regarding the two happiness indicators they show similar proportions than those of the HML-type countries.

Finally, regarding the relationship between the average levels of religiosity and life satisfaction, the results are consistent with the initial hypothesis: once we control for the prevalent religious motivation the average level of religiosity emerges positive and significantly associated with average life satisfaction. Moreover, our main proxy for the prevalent religious motivation also emerges highly significantly associated with average life satisfaction. In particular, we estimate that an increase of one standard deviation in the average frequency of attendance to religious services is associated with an increase of around one-tenth of a standard deviation in the life satisfaction scale. This effect is equivalent to that produced by an increase of one standard deviation in the index of collective social capital or around two-thirds of a standard deviation in the self-reported health measure. Importantly, that positive change would be cancelled out if it were accompanied by a similar increase (three-quarters of a standard deviation) in the proportion of individuals considering that religious

faith is a quality children must be encouraged to learn at home. The estimations are subjected to a wide variety of robustness checks and results remain largely unchanged. Moreover we carry out a thoroughly discussion of the endogeneity issues that may affect our results exploiting the panel nature of the data. We conclude that our results seem reasonably reliable and they are consistent with findings of the previous literature.

1.7.7 Outline of the thesis

The thesis consists of three chapters and the conclusions. Chapter 1 focuses on the analysis of the joint distribution of average life satisfaction and its determinants across countries. Chapter 2 focuses on the analysis of the joint distribution of the social foundations of happiness across countries. Chapter 3 focuses on the analysis of the relationship between religiosity and life satisfaction at the cross-country level. Finally, in the Conclusions we first discuss the role of the economics of happiness in happiness studies and policy, then we summarize the main results of the thesis from a global perspective, and finally we point out some limitations of our study and suggest future lines of research.

Chapter 2

A multidimensional taxonomy of countries based on life satisfaction and its determinants*

2.1 Introduction

Cross-country subjective well-being research has focused so far on comparative analyses of the distributions of subjective well-being (and their dynamics) across countries, and on identifying the determinants of countries' average levels of subjective well-being. Regarding the cognitive component of the phenomenon, as we extensively discuss in the next section, it has been found that there are some key predictors of average life evaluations: the average levels of income, health, social support and sociality, collective social capital, individual freedom, and the social norms concerning the experience and expression of subjective well-being.

However, it must be noted that there are significant differences across countries regarding the importance of the different determinants of life satisfaction (E. Diener & Diener, 1995; Schimmack et al., 2002). Moreover, the there are strong interrelations among the different determinants (Stiglitz et al., 2018), what complicates further their relationship with life satisfaction. In this regard, for instance, it has been theoretically stated (Layard, 2006) and empirically found (Bartolini et al., 2013; Bartolini & Sarracino, 2015; Mikucka et al., 2017; Pugno & Sarracino, 2019) that long-run increases in average income may be accompanied by a reduction in average life satisfaction if it comes at the expense of social capital. Importantly, both average life satisfaction and its determinants may be likely jointly determined by confounders such as the cultural background of the different countries.

*This chapter corresponds to an unpublished paper written along with Sergio Tezanos.

These mechanisms may likely explain why previous research on the distribution of life satisfaction across countries has found several groups of countries, such as the Latin American and the Caribbean countries, Confucian countries, and ex-communist countries, showing special patterns in life satisfaction.

Regarding the Latin American and the Caribbean countries, they show on average higher levels of subjective well-being than those that their average life circumstances would predict (Helliwell, 2003; Helliwell & Wang, 2013; Inglehart et al., 2008). It is argued that these countries enjoy higher levels of social support and sociality than countries from other regions and that, moreover, social relationships are particularly important for subjective well-being in these countries (Beytía, 2016; Rojas, 2018). Besides, Inglehart et al. (2008) found that countries from Latin America and the Caribbean present on average higher levels of self-perceived freedom than countries from other regions. Finally, E. Diener and Suh (1999) point out that there is a tendency in these countries to view pleasant emotions and satisfaction with life as desirable, and unpleasant emotions as relatively inappropriate.

Ex-communist countries have constituted a distinguishable country group in terms of subjective well-being for years (Bjørnskov et al., 2008; Helliwell, 2003; Inglehart et al., 2008), albeit it may be currently vanishing (Guriev & Melnikov, 2018). These countries have shown on average lower levels of subjective well-being than those that their life circumstances would have predicted. Bjørnskov et al. (2008) argued that the collapse of their political and economic systems could bring about a long-lasting period of instability in these countries that was not fully captured by standard indicators. Importantly, Helliwell (2003) already showed that within the group of ex-communist countries we may have to distinguish between Central and Eastern Europe, on the one hand, and the former Soviet Union, on the other, since the former region seemed to be losing their singularity faster. Moreover, Guriev and Melnikov (2018) have found that apart from the countries of Central and Eastern Europe, the Central Asia former Soviet republics are performing better than other members of the Commonwealth of Independent States in recent years.

Another well-established country group comprises the countries of East and Southeast Asia with a strong Confucian culture. These countries present, on average, mean levels of subjective well-being below those that their material life conditions would predict. It is argued that in Confucian countries there is relatively more acceptance of unpleasant emotions and relatively less acceptance of pleasant emotions (E. Diener & Suh, 1999; Ng, 2002). Regarding cognitive subjective well-being, it has been found that in China the ideal level of life satisfaction is neutrality (neither satisfied nor dissatisfied), whereas in other countries respondents view the

ideal as strong satisfaction with life (E. Diener & Suh, 1999). Ng (2002) points out that in East Asian countries there may be excessive competitiveness and conformity.

Finally, there are some other country groups that have emerged in different analyses of the distribution of subjective well-being and its determinants across countries, such as Scandinavia (Helliwell, 2003) and North America, Australia, and New Zealand (NAANZ) (Helliwell & Wang, 2013). Countries from both Scandinavia and NAANZ show on average higher mean life evaluations than those that their life circumstances would predict. Scandinavian countries stand out because they show higher values for most of the life evaluation determinants than other OECD countries. Regarding NAANZ, the reason may lie in the existence in these countries of strong norms encouraging the experience and expression of positive emotions and satisfaction with life (E. Diener & Suh, 1999; E. Diener, Suh, Smith, et al., 1995).

It must be noted that previous country groups have been identified using average estimations over the whole predefined group of countries; therefore they disregard any possible heterogeneity within groups. Moreover, although previous research has pointed out the main features of each group, we lack a systematic analysis of their characteristics. To fill these gaps, in this chapter we carry out a cluster analysis: a family of numerical techniques suitable for discovering patterns in multivariate distributions and grouping similar countries together. A first interesting result of our analysis may concern how the resulting classification of countries relates to previous literature country groupings.

There is another reason for performing cluster analysis on country-level data on life satisfaction and its main determinants. Thus, it seems that the impact on average life evaluations of a negative shock on a given factor, such as the level of income, may depend on the concurrent state of other sources of well-being, such as social capital. In this regard, Helliwell et al. (2015) point out that the consequences of the economic upheavals following the 2008 financial crises were much worse in countries with a weak social fabric (Greece) than in those with a strong one (Ireland and especially Iceland). Therefore, the resulting clustering may not only identify and characterize different groups of countries, but may eventually shed light on important issues concerning the determinants of subjective well-being and the consequences of changes in such determinants.

Cluster analysis groups objects relying only on the data found in the data set. This is a good feature of the method, albeit such objective procedure entails the caveat that the resulting clustering may be sensitive to the variables included in the analysis. Therefore, clustering variables should be chosen carefully based on conceptual underpinnings. Accordingly, in the next section we thoroughly discuss

the state of the art of research on the determinants of national levels of cognitive well-being. On this basis, we carry out a hierarchical cluster analysis using as clustering variables proxies for five well-established determinants of average life satisfaction: the average levels of income, health, social support and sociality, collective social capital, and freedom, and additionally average life satisfaction itself (which, on top of being interesting as a clustering variable on itself, may capture information about the social norms concerning the experience and expression of subjective well-being).

Such cluster analysis enables us to identify five groups of countries in relation to their average levels of life satisfaction and its determinants. Overall, the resulting "life satisfaction taxonomy" is consistent with the main findings of the previous literature regarding country groupings, although it also includes some original and interesting results. We show that the resulting five-cluster solution is robust to the clustering method. In the end, we argue that this chapter contributes to cross-country subjective well-being research by providing a well-founded classification of countries and a systematic characterization of each country category. However, we do not suggest our classification is the end in itself, nor definitive. More work on taxonomies is required using better proxies for some of the factors considered. Moreover, future research may try to link the taxonomy to variations in relevant aspects concerning the distribution of life satisfaction, such as its dispersion, determinants, resilience, and trends.

2.2 Determinants of the distribution of average life satisfaction across countries

Most recent models that attempt to explain societal differences in average life evaluations have been proposed within the *World Happiness Report*. In particular, Helliwell and Wang (2013) established a very parsimonious model that focuses on six arguably universal factors which importance is in general well-established in the literature: income, health, social support and sociality, freedom, collective social capital,[1] and generosity. We will adopt this model as reference and in what follows we would briefly discuss the theory and evidence regarding those six factors. Then we would discuss some other factors pointed out by other research.

[1]We use the concept of collective social capital (Scrivens & Smith, 2013) because although Helliwell and Wang use a measure of the perceived absence of corruption in government and business they have pointed out elsewhere that their aim is not only to proxy for the actual absence of public and private corruption but for good governance in general –defined as the overall trustworthiness of public institutions and the quality of delivery of public services– and for interpersonal trust (Helliwell et al., 2017).

A large economic tradition assumes a positive relationship between income and well-being arguing that the former allows individuals to satisfy their needs (Rojas, 2009) or, more generally, their wants according to their preferences (Boarini et al., 2006; OECD, 2007). The capability approach points out that income enlarges the capacity of individuals to be and to do what they have reasons to value (Sen, 2000). In this regard, one important function of income is allowing individuals to "appear in public without shame" (Sen, 2000, quoting A. Smith, 1776). Precisely, an important strand in economics argues that income may have fundamentally a relative value (Duesenberry, 1949) that depends on the income of relevant others. In the extreme case, a general increase in real income within the reference group will not have any impact on well-being because all individuals will remain equal in relative terms. Generally it is thought that reference groups are established within countries. Under this assumption, and provided other things are held equal, it follows that the relationship between income and well-being would be larger within a country than across countries.

Some authors have found that the correlation between income and life evaluations at the cross-country level is at least as high as the correlation at the individual level within a country (Deaton & Stone, 2013; Stevenson & Wolfers, 2008). Two possible reasons are, first, the prevalence of the absolute effect of income, and, second, attending to its relative value, the fact that the standards of evaluation are becoming international (Dolan et al., 2008). Moreover, Deaton and Stone (2013) find that the correlation at the cross-country level is actually larger than at the individual level. According to these authors this would suggest that the aggregate income captures positive spillovers from having rich people nearby or the informational value it may have regarding the future income of individuals (information that would be relevant if life evaluations are based not on current income but on expected permanent income). However, the simple correlation between income and life evaluations at the cross-country level may be driven by other factors positively correlated with both income and life evaluations (Frey & Stutzer, 2002). Layard et al. (2012) show that the estimated cross-country income effect falls sharply when other variables, like the ones we would discuss below, are included in the model. It is possible that high income in a country is good for health, social support, freedom, and collective social capital, but they argue that from a public policy point of view it is important to separate out the effects of income from those of other factors. Besides, including other factors may likely contribute to further explain the variation in life evaluations across countries, which is far from being completely explained by income.

The average health status of the population is a factor widely considered by the literature given the importance of health for individuals (Dolan et al., 2008), although when it is measured by the life expectancy at birth it hardly contributes to explain world patterns of subjective well-being once income per capita is taken into account (Stutzer & Frey, 2012). Some authors have employed a measure of health that adjusts life expectancy at birth by the quality of life (healthy life expectancy at birth) and have found that it is an important factor underlying the distribution of mean life evaluations across countries (Helliwell & Wang, 2013; Layard et al., 2012). In their exhaustive analysis Bjørnskov et al. (2008) find that the infant mortality rate is significantly associated with the life evaluations of individuals. Ideally, cross-country analyses would have to consider mental health measures (Clark et al., 2017), although there are important data constraints in this regard. Some mental health conditions are closely related with the affective component of subjective well-being, which is itself a key determinant of life evaluations (Schimmack et al., 2002).

Social support and sociality, or individual social capital (Scrivens & Smith, 2013), is a factor extensively considered in analyses both within and across countries (Blanchflower & Oswald, 2011; Clark et al., 2017; Layard et al., 2012). The condition of basic psychological need of positive, close, and robust social relationships that provide support and meaning is currently one of the most widely accepted and influential thesis in the Social Sciences (E. Diener & Seligman, 2004; Helliwell et al., 2017). We may include under the category of social support and sociality several domains that are sometimes separately considered, such as the family, marital status, and friends. Interestingly, it is argued that, beyond the relative income hypothesis, this factor may be one of the main determinants of the "Easterlin paradox." Thus, the fact that average life evaluations are stagnant, if not decreasing, in several countries despite their robust economic growth seems to be partly caused by an impoverishment of personal relationships (Bartolini et al., 2013; Bartolini & Sarracino, 2015; Blanchflower & Oswald, 2004).[2]

Collective social capital is defined as the networks together with shared norms, values and understandings that facilitate cooperation and trust between all members of a community or society (Scrivens & Smith, 2013). Adam Smith already pointed out in the Wealth of Nations the importance of social norms that enable people to plan in some confidence that others would deliver as promised, limiting, at the same time, the use of coercion (A. Smith, 1776). Knack and Keefer (1997), who also focused on the economic effects of the strength of norms of civic cooperation, stated

[2]See Layard (2006) for a theoretical discussion on the possible trade-offs between economic growth and social support and sociality.

that these norms act as constraints on narrow self-interest, eventually increasing inter-personal trust, and, as a consequence, reducing transaction costs and realizing resources for more valuable purposes. The positive impact of the prevalence of civic behaviors and norms may likely go beyond the economic sphere because trust replaces suspicion and fear (Helliwell, 2003) and certain civic behaviors, such as politeness, constitute relational goods that are valuable in their own regard (Bruni, 2008).[3] Helliwell (2003) found that the level of inter-personal trust is positively correlated with life satisfaction at the cross-country level.

Public institutions and private corporations channelized important social relationships, and this is the reason why the performance of politicians and civil servants, on the one hand, and managers and workers, on the other, is usually considered a key manifestation of collective social capital. One basic measure is the level of corruption, which is negatively correlated with average life evaluations at the cross-country level (Helliwell & Wang, 2013; Layard et al., 2012). Beyond the mere absence of corruption, collective social capital concerns the "reliability and responsiveness [of institutions] in their design and delivery of services" (Helliwell et al., 2017, p. 34). For instance the education and health systems may reflect the ability of a society to care for people. In this regard, strong welfare states and public spending have been found to enhance average subjective well-being (Blanchflower & Oswald, 2011), at least for some important social groups (Bjørnskov et al., 2008). Confidence in main public institutions has also been shown to be associated with average life evaluations (Helliwell et al., 2017). One important aspect of the public life domain is the political and social stability (E. Diener & Seligman, 2004). In this regard, Bjørnskov et al. (2008) interpret their finding on the significant positive association between a bicameral political system and life evaluations as the effect of a system that with its checks and balances facilitates stability. Moreover, they interpret the negative association between the condition of post-communist country and the average level of life satisfaction in terms of the lack of political and social stability.

Freedom –the ability of people to pursuit their personal desires– is strongly associated with average life evaluations at the cross-country level (Helliwell & Wang, 2013; Inglehart et al., 2008; Layard et al., 2012). Inglehart et al. (2008) empirical findings suggest that among the main drivers of self-perceived freedom are income growth, social tolerance (towards sexual orientation and gender equality) and democratization. More secure human rights and gender equality have been found to be associated with the level of subjective well-being (E. Diener, Diener, & Diener,

[3]Seemingly considering this civic dimension of people's social life, Clark et al. (2017) point out that "each of us ... has a marked impact on the happiness of other people" (p. 132).

1995). On the other hand, the effect of democracy has fail to be significant in studies that include both developed and developing countries, where stability and the quality of public services seems to be more important (Bjørnskov et al., 2008; Helliwell et al., 2017). Interestingly, the results of Helliwell et al. (2017) suggest that the impact of freedom on average live evaluations is channeled through positive affective experiences.[4]

Generosity or altruism is an attitude concerning human relationships that entails a cost for individuals that behave generously (Layard et al., 2012). Evidence shows that giving support to other people might be at least as important as receiving social support in terms of coping with stressors, longevity and subjective well-being (E. Diener & Seligman, 2004; Helliwell et al., 2017). Altruistic behaviors, such as volunteering, may enhance subjective well-being either for intrinsic or extrinsic reasons,[5] although evidence shows that the effect is larger when it is intrinsically motivated (Meier & Stutzer, 2008). In fact, some evidence suggests that volunteering enhances subjective well-being only if it is carried out for other-regarding motivations, which is a particular kind of intrinsic motivation (Becchetti et al., 2017). Research at the cross-country level is scarce yet. Helliwell and Wang (2013) show that generosity (measured as the residuals of the regression of the proportion of donors to charities in the last month on the income per capita of the country) presents a positive and significant association with average life evaluations in their six factors model.

Beyond Helliwell and Wang (2013) model, some evidence suggests that there are some economic factors other than income underlying societal differences in average life evaluations. On the one hand, the effects of unemployment and inflation have been extensively studied (Blanchflower & Oswald, 2011). However, evidence is mostly focused on developed countries and is not conclusive for Europe regarding unemployment (Dolan et al., 2008). Gándelman and Hernández-Murillo (2009), who gather a sample of 75 countries, among them many developing countries, find a significant association between the unemployment and inflation rates and average life evaluations. However they do not control for any other economic factor. Bjørnskov et al. (2008), using a sample of 70 countries and controlling for several personal characteristics and aggregate factors, find that the effects of national income and the unemployment and inflation rates fail to be significant. On the other hand, they

[4]Thus, once they include a control for the affective component of subjective well-being in the regression of average life evaluation on six factors –among them perceived freedom–, the coefficient associated with the latter loses its significance.

[5]An intrinsic reward is a direct result of the activity or of its outcome, whereas an extrinsic reward is an external benefit with respect to which the activity is instrumental. If extrinsic rewards are the main motivation of a given pro-social behaviour it is said that it is carried out for strategic reasons.

find that the business climate, as measured by the investment price level relative to that of the USA, and the openness of the economy, as measured by the sum of exports and imports in percent of GDP, are the only relevant aggregate economic factors. On the other hand, national income and the unemployment rate seem to be relevant only for some specific social groups. This evidence is promising, although so far the only economic factor that is well-established in the literature is national income.

There is also evidence that suggests that income inequality has a negative effect on life evaluations (Alesina et al., 2004; E. Diener, Diener, & Diener, 1995; Goff et al., 2016; Helliwell et al., 2016). E. Diener, Diener, and Diener (1995) argue that, firstly, more individuals may be able to achieve their goals in countries where there is more equality and, secondly, it is likely that where inequalities are great, issues of equity and social justice arise.[6] Moreover, we may expect a negative correlation between both variables because income inequality is associated with several social problems that negatively impact life evaluations, such as the bad functioning of institutions, antisocial behavior, insecurity and low interpersonal trust (Knack & Keefer, 1997). On the other hand, Alesina et al. (2004) showed that the relationship between income inequality and life evaluations is complex and found significant differences between Europe and the United States, with left-wingers and the poor in Europe being more concerned with inequality than their American counterparts. They interpreted these findings in terms of the perception of social mobility. Moreover, other studies highlight the ambivalence of income inequality in terms of life evaluations depending on the opportunities open to individuals (Bjørnskov et al., 2008; Dolan et al., 2008). In general, evidence on the negative effect of income inequality on life evaluations is not conclusive as estimations at the cross-country level fail often to be significant when using the Gini coefficient as a proxy (Bjørnskov et al., 2008; Graham & Felton, 2006; Helliwell et al., 2016).

E. Diener, Diener, and Diener (1995) found that individualism was a major factor explaining societal differences in average life evaluations. In fact, individualism was the only factor that remained significantly associated with average subjective well-being once other important factors (such as national income, human rights, and societal equality) were accounted for. Individualism is a cultural trait that refers to people's orientation toward personal goals and desires as opposed to group goals. Importantly, individualism is likely associated with two previously discussed factors:

[6]E. Diener, Diener, and Diener (1995) included income inequality within the broader issue of social inequality along with health inequality and gender inequality. However most research focus on the issue of income inequality. Following Inglehart et al. (2008) we consider gender inequality a measure of discrimination and ultimately an indicator of freedom.

freedom and social support. Thus, in individualistic cultures there is more personal freedom, whereas in non-individualistic (collectivist) cultures there might be greater feelings of social support. Individualism is also associated with the income level (E. Diener & Seligman, 2004). In this regard, Falk et al. (2018) show that individualism and weak family ties are associated with the prevalence of a particular time preference: patience, that enhance economic growth. Interestingly, individualism and weak family ties are two cultural traits that along with Protestantism are usually referred to as the spirit of capitalism –after Weber (1904)– in several different literatures in cultural economics and long-run development (Falk et al., 2018).

Other cultural traits that seem to influence average levels of subjective well-being are the norms governing the experience and expression of emotions and satisfaction. Individuals from some cultures believe that life satisfaction and pleasant affect are especially desirable, whereas some cultures emphasize the relative appropriateness of unpleasant emotions. Cultures that view pleasant emotions as positive and desirable tend to be happier, whereas cultures which perceive unpleasant emotions as normatively desirable experience lower subjective well-being (E. Diener & Suh, 1999). Precisely, one of the reasons why individualistic cultures may report higher levels of subjective well-being is that "individualists are likely to place more value on personal well-being and thus seek SWB to a greater extent" (E. Diener, Diener, & Diener, 1995, p. 853).

Evidence suggests that Confucian cultures from the Pacific Rim (e.g., China, Korea, and Japan) tend to accept unpleasant emotions relatively more and to accept pleasant emotions relatively less than other cultures. On the contrary, in the United States and Latin America there is a tendency to view pleasant emotions as desirable (E. Diener & Suh, 1999; E. Diener, Suh, Smith, et al., 1995). Besides, in Latin America there seems to be a tendency to view unpleasant emotions as relatively inappropriate (E. Diener & Suh, 1999). Regarding life evaluations, in China the ideal level of life satisfaction is neutrality (neither satisfied nor dissatisfied), whereas in countries such as Spain, Colombia, and Australia respondents view the ideal as strong satisfaction with life (E. Diener & Suh, 1999). In accordance with previous evidence, people in Japan, South Korea, and China express lower life satisfaction and general happiness than people in the United States (E. Diener, Suh, Smith, et al., 1995; Ng, 2002). In general, E. Diener and Suh (1999) report that the mean ideal level for satisfaction with life correlated 0.73 with the mean reported life satisfaction across nations.

Summing up, the previous discussion shows that Helliwell and Wang (2013) model includes some factors that have been consistently found by the literature as

important determinants of the distribution of average life evaluations across countries. In fact, the predictive power of the model is very high: it explains around three quarters of the observed cross-country variation in average life evaluations using data from the Gallup World Poll from around 150 countries along multiple years (Helliwell et al., 2015, 2016, 2017; Helliwell & Wang, 2013). The only factor included in Helliwell and Wang's model that has not been extensively studied by the literature is generosity. On the other hand, there is some promising evidence questioning the relevance of national income and pointing out the importance of the business climate and the openness of the economy, although further evidence and a better understanding of the role of the different economic factors is needed before we can spare from national income as a proxy for them. Moreover, individualism, which seems to be an important cultural trait affecting subjective well-being, has been shown to be strongly associated with two factors included in the model: income and freedom. Finally, the norms governing the experience and expression of emotions are neither explicitly accounted for in the model and they are likely to be part of the error term (Helliwell et al., 2017).

2.3 Method

According to the previous literature review, there are certain universal determinants of average life evaluations. However, it is also apparent that the different factors affecting average life evaluations interact in a complex way. This fact encourages using a method of analysis suitable for discovering patterns in the data on average life evaluations and their determinants. In this section we will argue that cluster analysis offers a nuanced statistical technique for the composition of groups of countries and allows us to include a range of indicators that captures –although full capture would be impossible– the multidimensional nature of life satisfaction.

2.3.1 Cluster analysis

Cluster analysis is a set of numerical techniques that are suitable for classifying a sample of heterogeneous countries in a limited number of groups, each of which is internally homogeneous in terms of the similarities between the countries that comprise it. As Everitt et al. (2011) explain:

> Cluster analysis techniques are concerned with exploring data sets to assess whether or not they can be summarised meaningfully in terms of a relatively small number of groups or clusters of objects or individuals which

> resemble each other and which are different in some respects from individuals in other clusters. (Everitt et al., 2011, p. 13)

The advantage of these procedures is that they allow us to discern the association structure between countries, which facilitates the identification of the key characteristics of each cluster. Moreover, cluster analysis deals with two intrinsic problems in the design of an international classification. First, it facilitates the determination of the appropriate number of groups in which to divide the sample of countries. Second, given that each country has different values on the set of indicators, cluster analysis allows a synthetic distribution that makes it easier the comparison of life satisfaction and its determinants across countries.

In particular, hierarchical clustering techniques are a family of procedures that create a set of nested clusters that are organized as a tree. Agglomerative procedures start with each object (country) as a singleton cluster and then repeatedly merge the two closest clusters until a single, all-encompassing cluster remains (Tan et al., 2006). Hierarchical clustering techniques allow us to build a taxonomy of countries with heterogeneous levels of life satisfaction and its main determinants in order to divide them into a number of groups so that: i) each country belongs to one–and only one–group; ii) all countries are classified; iii) countries of the same group are, to some extent, internally homogeneous; and iv) countries of different groups are noticeably dissimilar (Tezanos & Sumner, 2013).

Hierarchical clustering is especially suitable for the analysis of objects that follow the same trends in terms of evolution and change as biological organisms (Strauss & Maltitz, 2017). The analysis of social systems is one of the fields for which this method is particularly suitable (Everitt et al., 2011), although the heterogeneity of our sample of countries makes it mostly useful to find a solution with an "optimal" number of clusters. Therefore, we may have to be cautious regarding the interpretation of the final results in terms of evolution and change. A nice feature of hierarchical clustering techniques is that they are not affected by initialization problems as they search for groups in the data either initially considering that the whole set of objects constitutes a unique cluster (divisive methods) or considering that each object constitutes one cluster (agglomerative methods). Moreover, these procedures do not require the researcher to determine ex-ante the number of clusters.

2.3.2 Variables and data

In this paper we use data from the Integrated Values Survey 1981-2014 (IVS), which merges data from the World Values Survey (WVS, 2015) and the European Values

Study (EVS, 2015). The latter have collected data on life satisfaction and most of its determinants since 1981 –along six and four rounds, respectively– for nationally representative samples of 109 countries around the world.[7] A traditional caveat with the IVS family of surveys was that low and middle income countries were under-represented, however in the last rounds of the World Values Survey this issue has being mitigated.

Cluster analysis entails a number of somehow discretionary decisions. The first concerns the number of clustering variables to be used in the analysis. In terms of a reasonable relationship between the sample size and the number of clustering indicators, we apply Formann (1984) rule that recommends a minimum sample size of 2^n, where n equals the number of clustering variables. In our case, with a potential sample of 109 countries, the maximum n is equal to six. We may focus on life satisfaction and five factors that have been consistently found as important determinants of the distribution of average life evaluations across countries (see previous section): income, health, social support and sociality, collective social capital and freedom.

Table 2.1 shows the different classification variables considered in our analysis, the indicators and the method of construction. All indicators but the GDP per capita are based on individual level data collected along several years in different countries. We aggregate individual-level data to get country-level data using the weights provided by the survey to get unbiased estimations. To make them more reliable and cancel out the transitory effects of economic fluctuations,[8] which timing varies across countries, we follow a standard practice in the literature and compute averages by country using the IVS rounds carried out between 1994 and 2014 (waves 3 to 6). The value of income corresponds with the average GDP per capita of the years in which each country participated in the survey weighted by the corresponding sample size.[9]

[7] We keep individuals aged 18+ years. We drop observations from Bosnia from the third wave of the WVS because the sample is not representative of Bosnia-Herzegovina. We merge observations from Northern Cyprus and Cyprus from the fourth wave of the EVS to have representative data for Cyprus at a whole—observations are weighted according to the population of each of these entities in that year according to the Statistical Service Republic of Cyprus (2009). Regarding observations from Serbia and Montenegro from the fifth wave of the WVS, according to the study description included in the results book of the fifth wave the target population was the population of Serbia of voting age, therefore we assign such observations to Serbia.

[8] See Layard et al. (2012) regarding life evaluations.

[9] Using 20-year averages implies a strong assumption of stability. In fact there is evidence of strong persistence in most of the selected variables. Bjørnskov et al. (2008) argue that the levels of life satisfaction within a country are relatively invariant over time as compare to their variability across countries. Regarding the life satisfaction determinants, Alesina and Giuliano (2010) attribute to second-generation immigrants in the US contemporaneous beliefs about the family in the country of origin of their parents arguing that cultural traits, such as those concerning

Table 2.1: Classification variables

Classification variables	Indicators	Sources	Methods of construction
I. Life satisfaction	1.1. Self-reported life satisfaction	WVS (2015) and EVS (2015)	Weighted average by country
II. Income	2.1. GDP per capita PPP (constant 2011 int. $)	World Bank (2018)	Natural logarithm of the weighted average by country
III. Health	3.1. Self-reported health	WVS (2015) and EVS (2015)	Weighted average by country
IV. Social ties	4.1. Family is considered very important 4.2. Friends are considered very important	WVS (2015) and EVS (2015)	Adding both indicators (each as weighted average by country)
V. Collective social capital	5.1. Interpersonal trust 5.2. Confidence in police 5.3. Confidence in Parliament	WVS (2015) and EVS (2015)	Adding the three indicators (each as weighted average by country)
VI. Freedom	6.1. Self-reported freedom of choice	WVS (2015) and EVS (2015)	Weighted average by country

Source: Compiled by the Authors.

Regarding overall life evaluations, the IVS includes the following question: "All things considered, how satisfied are you with your life as a whole these days? Using this card on which 1 means you are 'completely dissatisfied' and 10 means you are 'completely satisfied' where would you put your satisfaction with your life as a whole?" We use as measure of GPD per capita the variable from the World Bank's *World Development Indicators* (World Bank, 2018): "GDP per capita, PPP (constant 2011 international $)." Following standard practice, the variable is expressed in logarithmic terms.[10]

Regarding physical and mental health, we use a 5-point scale measure of self-reported health which response scale ranges from one ("very good") to five ("very poor"). We reverse the response scale for the ease of interpretation. This measure is widely supported by the specialized literature as a measure of health within countries because it has been found to be a good predictor of morbidity and mortality (Cislaghi & Cislaghi, 2019) and also in cross-country health research as a more holistic measure of mental and physical health (OECD, 2019), although there are serious concerns regarding the comparability of the responses across countries, especially across developed and developing countries (Kuhn et al., 2006).

Social support and sociality are measured by means of an index of social ties. The index is constructed using two questions on the importance of family and friends for the respondent. The responses range from 1 (very important) to 4 (none at all important). We transform these 4-point scale variables into two binary variables indicating whether the specific source of social support and sociality is very important for the respondent.[11] After computing the country averages of these two items,

family ties, are quite stable –and moreover partially inherited from previous generations. Knack and Keefer (1997) showed that the level of interpersonal trust is a highly stable social feature. Rojas (2018), implicitly assuming their stability, characterizes subjective well-being and its social foundations in Latin America as compares to some Anglo-Saxon and Western European countries estimating average values of different indicators using data from all waves of the World Values Survey (1981-2014) and the Gallup World Poll (2006-2016). On the other hand, the *World Happiness Report* has documented significant changes in average life evaluations in recent years in several countries. Part of those changes is likely due to temporal economic, political and social stresses/easings. However, long term variations are also very likely as life circumstances may consistently worsen/improve, for instance most countries from Central and Eastern Europe may be thought to be immersed in a long term improvement of their life conditions (Guriev & Melnikov, 2018; Helliwell, 2003). In this chapter we are interested in identifying the current association structure between countries and left possible dynamics for future research. We may be safe as long as possible dynamics along the 20 years period it is not as high as to produce noise that obscures the identification of relevant clusters.

[10]It is well-established that the relationship between the national level of income and average life evaluations is logarithmic (Deaton, 2008). Moreover, in cluster analysis highly skewed variables, as is the case of GDP per capita in a worldwide sample, are usually transformed by taking the natural logarithm (Onda et al., 2014). In the next section we may comment how this transformation affects our results.

[11]By focusing on the extreme value we aim at both ensuring the discriminating power of the

the index of social ties is calculated as the sum of the resulting two proportions. The importance of the family has been previously used in measures of family ties (Alesina & Giuliano, 2010). Helliwell et al. (2017) point out the need for measures of social support and sociality assessing the contributions of both family and friends. In this regard, some evidence shows the importance of including both sources of social support and sociality (Pugno & Verme, 2012).

Following Helliwell et al. (2017), collective social capital is measured by means of an index of social trust and confidence in two relevant public institutions: police and parliament. The IVS measures generalized trust by means of a binary variable indicating whether, according to the respondent, most people can be trusted, whereas the confidence in public institutions is measured by means of 4-point scale variables which responses range from one ("great deal of confidence") to four ("none at all"). We transform the latter into binary variables taking value one whenever the response was either "great deal of confidence" or "quite a lot of confidence" to resemble the response scale of generalized trust. After computing the country averages of those three items, the index of collective social capital is calculated as the sum of the resulting three proportions.

Freedom is measured by means of the question: "Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Please use this scale where 1 means 'no choice at all' and 10 means 'a great deal of choice' to indicate how much freedom of choice and control you feel you have over the way your life turns out."

Finally, we have complete data for 103 countries that comprise 88% of the world population and cover most geographical and cultural regions.[12] Table A.1 in Appendix A shows the complete data set and Table A.2 shows the descriptive statistics of the six variables.

Importantly, one must examine the variables for substantial collinearity before the clustering process.[13] The initial data set includes six variables that proxy dif-

indicator and being able to use data from Colombia in 2005, where response categories were partially different.

[12] According to the United Nations, Department of Economic and Social Affairs, Population Division (2017), by geo-political area our sample includes countries that represent: 99 per cent of Western Europe, 100 per cent of Central and Eastern Europe, 95 per cent of the Commonwealth of Independent States, 95 per cent of South Asia, 88 per cent of South-Eastern Asia, 96 per cent of East Asia, 88 per cent of Latin America and the Caribbean, 99 per cent of North America and Australia and New Zealand, 78 per cent of the Middle East and North Africa, and 55 per cent of Sub-Saharan Africa. The less well represented area is Sub-Saharan Africa, for which we lack data from many important countries (Kenya, Madagascar, Mozambique, Somalia, South Sudan, Angola, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Niger, Côte d'Ivoire, Senegal).

[13] If highly correlated variables are used for cluster analysis, specific aspects covered by these

ferent life dimensions, therefore high correlations among them are not surprising. Nevertheless, we do not find evidence indicating problematic correlations between pairs of variables, although *Freedom* and *Life satisfaction* are the pair of variables with a higher correlation coefficient (see correlation matrix in Table A.3).

2.3.3 Clustering method

Agglomerative hierarchical clustering requires defining a notion of cluster proximity, which involves a distance metric and a linkage method. Given the type of data used in this analysis (six continuous variables), three possible linkage methods are the complete linkage method, the average linkage method, and the J. Ward (1963) method.

For a given distance metric, the complete linkage method aims at minimizing at each stage the distance between the farthest two points from different clusters. Complete linkage tends to find compact clusters with equal diameters (Everitt et al., 2011).

The average linkage method aims at minimizing at each stage the average pairwise distance of all pairs of points from different clusters. This method uses to provide a good *cophenetic correlation*, thus a high correlation between the distance at which objects (countries) are first merged in the hierarchical clustering procedure and their actual distance based on the original data points (Kassambara, 2017). However, the average linkage method is more likely to provide unbalanced and straggly clusters as compare to the complete linkage method (Everitt et al., 2011).

Finally, in the Ward's method the fusion of two clusters is based on the size of an error sum-of-squares criterion. The objective at each stage is to minimise the increase in the total within-cluster error sum of squares. Ward's method tends to find same-size, spherical clusters. The minimum variance criterion links the Ward's method with the (squared) Euclidean distance metric. In practical terms, the Ward's method has been proven to be especially suitable for building clusters with similar sizes, when no outliers are present (Everitt et al., 2011; S. Hands & Everitt, 1987; Mooi & Sarstedt, 2011).

Since there is no objective criterion for selecting the most appropriate linkage method, the selection depends largely on the interpretability of the final results. In this research, we conduct a hierarchical cluster analysis using the Ward's method,[14]

variables will be overrepresented in the outcome. Everitt et al. (2011) and Mooi and Sarstedt (2011) argue that absolute correlations above 0.9 are problematic.

[14]Relying on data normalized to the 'range -1 to 1' and on the Euclidean distance metric, the average linkage method results, as expected, in a higher cophenetic correlation (0.636) than the complete linkage and Ward's methods (0.532 and 0.558 respectively). However, the average

computing the squared Euclidean distances between each element,[15] and standardising the variables to correct differences in scale according to the 'range -1 to 1'.

The next stage is to decide on the number of country groups (that is, the number of clusters to retain from the data). This decision is based on three different tools: the dendrogram, the agglomeration schedule, and the variance ratio criterion. All computations were performed with R version 3.6.1 (R Core Team, 2018), using the packages *BBmisc* (Bischl et al., 2017) for data standardization and *factoextra* (Kassambara & Mundt, 2019).

Hierarchical clusterings are often displayed graphically using a tree-like diagram called a dendogram that displays both the cluster-subcluster relationships and the order in which the clusters were merged (Tan et al., 2006). Thus, the nodes of the dendrogram represent clusters and the lengths of the stems (heights) represent the distances at which clusters are joined (Everitt et al., 2011). This graph provides guidance regarding the number of groups to retain, suggesting that a five-cluster solution is appropriate.[16]

The agglomeration schedule displays the clusters combined at each stage and the distances at which clusters merge.[17] This schedule is used to determine the optimum number of country groups. Thus, by plotting those distances against the number of clusters we can identify a break or 'elbow,' that is, where an additional combination of two clusters occurs at a greatly increased distance. The number of clusters prior to the merger is the most probable solution. In this way, and despite the high number of countries included in the graph, the scree plot shows a distinct break due to the increase in distance when switching from a five to a four-cluster solution.[18]

Caliński and Harabasz (1974) proposed a more precise and objective method

linkage method results in very unbalanced clusters that perform poorly in terms of several internal validity measures that would be discussed later: the variance ratio and the silhouette coefficient. According to all these measures the Ward's method performs better than the complete linkage method. Results are available upon request.

[15]Ward's method is associated with the Euclidean distance metric, although it has been shown that the Ward's algorithm can also be used with Manhattan distances, in which has been called the least absolute error version of Ward's Method (Strauss & Maltitz, 2017). The least absolute error version of the method may be interesting when dealing with outliers. In fact, this version of the method is preferred according to several internal validity measures when using as clustering variable GDP per capita instead of its logarithm and the simple z standardization, to avoid several heterogeneous countries being merged together due to their very high levels of national income. Under the logarithmic transformation and the standardization according to the 'range -1 to 1,' the Euclidean distance metric, thus the classical Ward's method, is preferred on the basis of the variance ratio, the silhouette coefficient, and the Dunn index. Results are available upon request.

[16]See the dendrogram plot in Figure A.1.

[17]See Table A.4. For example, in the first stage, Poland and Slovakia are merged at a distance of 0.202. From here onward, the resulting cluster is labelled as Cluster 1.

[18]See the scree plot in Figure A.2.

for determining the optimum number of clusters (Milligan & Cooper, 1985). The 'variance ratio criterion' (VRC) recommends choosing the number of clusters that maximises the ratio between the overall between cluster variation and the overall within-cluster variation with regards to all clustering variables (that is, a good clustering yields groups of countries with small within-cluster variation but high between cluster variation). In our case, this suggests that the optimum number of clusters is five.[19]

Therefore, using the three procedures (the dendrogram, the distances scree plot, and the VCR) we take the optimum number of clusters to be five. Before comparing the characteristics of these five clusters, it is worthwhile to distinguish which variables are more influential in discriminating between countries. This step is particularly important as cluster analysis sheds light on whether the groups of countries are statistically distinguishable (that is, whether the clusters exhibit significantly different means in terms of subjective well-being and its determinants).

In order to assess differences between clusters and identify the most discriminative characteristics, we perform a one-way ANOVA analysis to calculate the cluster centroids and compare the differences formally. The size of the F statistics shows the relation between the overall between-cluster variation and the overall within-cluster variation and, therefore, it is a good indicator of the relevance of each variable for identifying groups of countries. According to this analysis, the six variables included in the analysis contribute to the classification.[20] The variables with the greatest discriminating power are freedom and life satisfaction, followed by health. By contrast, the variables with lowest relative importance in the classification are social ties and income.

2.4 Discussion of the international life satisfaction taxonomy

2.4.1 Main features of the life satisfaction clusters

As noted, the exercise produces five clusters.[21] Figure 2.1 shows the dendogram with the "optimal" one-level partition distinguished by colour. The first cluster ($C1$) includes 16 countries; the second ($C2$) is composed of 23 countries; the third ($C3$) includes 19 countries; the forth ($C4$) has also 19 countries; and the fifth ($C5$) includes 26 countries.

[19] See the VRC in Table A.5.
[20] See the ANOVA output in Table A.6.
[21] Table A.7 shows the complete set of countries classified by cluster.

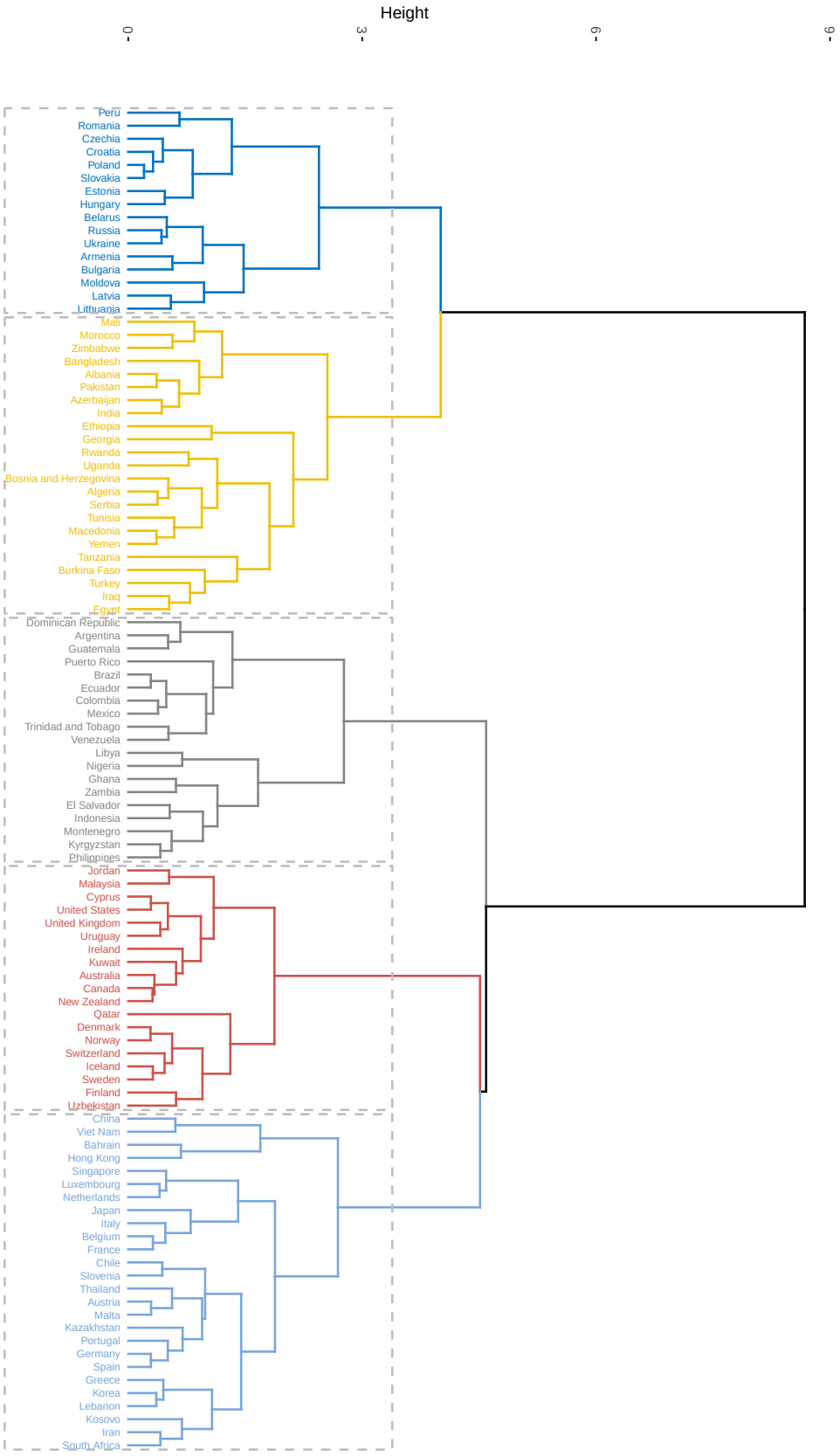

Figure 2.1: Dendogram: Five-cluster solution

The life satisfaction clusters are scattered across the geographical regions, albeit we may distinguish some clear patterns. Thus, as shown in Figure 2.2, there is a concentration of countries in $C1$ in Central and Eastern Europe and the European side of the Commonwealth of Independent States. $C2$ includes many countries from the Middle East, North Africa and South Asia. There is a concentration of countries in $C3$ in Latin America and the Caribbean and the Southeast Asian islands. $C4$ includes countries from the Anglosphere and Scandinavia. Finally, there is a concentration of countries in $C5$ in Western (continental) Europe, and Central and East Asia.

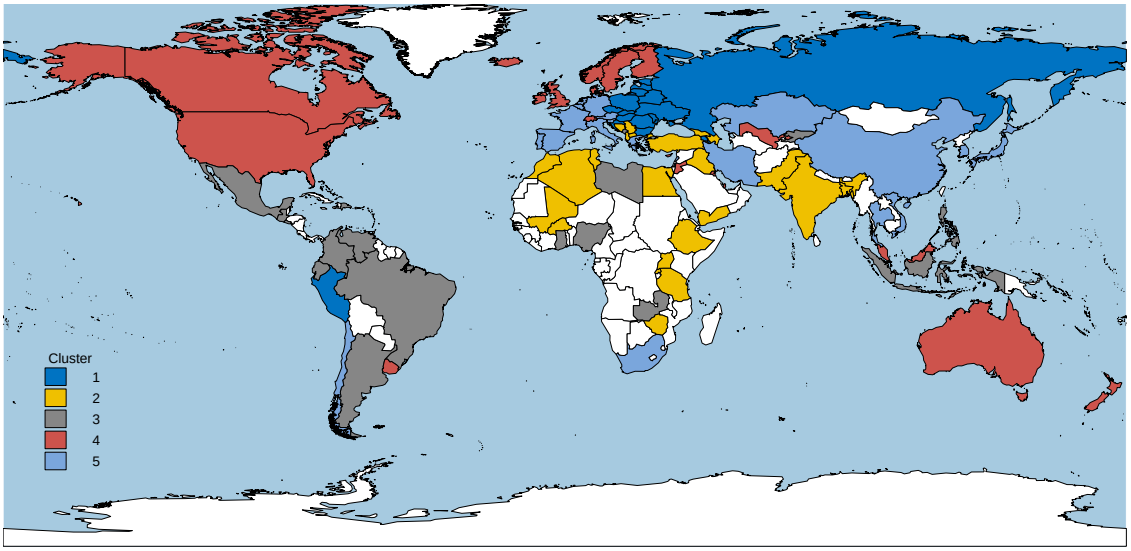

Figure 2.2: Geographic distribution of the life satisfaction country clusters

A more precise interpretation of the characteristics of the five clusters obtained in the analysis involves examining the cluster centroids (that is, the variables' average values of all countries in a certain cluster). This procedure enables us to compare the average characteristics of each group of countries. Table 2.2 shows the absolute average value of the clustering variables by cluster and their standard deviations. Figure 2.3 graphically displays the relative value of the cluster centroids in terms of the maximum and minimum values of the different clustering variables.

Table 2.2: Means (Std. dev.) for classification variables by country clusters

Cluster	Life satisfaction		Income		Health		Social ties		Collective social capital		Freedom	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
1	5.886	0.67	14,552.98	5,866.45	3.432	0.173	1.162	0.132	0.912	0.203	6.368	0.464
2	5.627	0.563	12,576.69	12,301.22	3.785	0.16	1.421	0.166	1.193	0.259	6.176	0.348
3	7.294	0.651	12,109.49	14,560.79	3.947	0.189	1.378	0.138	0.894	0.254	7.572	0.385
4	7.623	0.441	33,619.21	15,166.27	4.122	0.14	1.509	0.074	1.689	0.319	7.576	0.22
5	7.049	0.474	30,768.81	18,360.39	3.87	0.143	1.266	0.135	1.45	0.359	6.844	0.371

Source: Authors.
Data: WVS (2015), EVS (2015) and World Bank (2018).

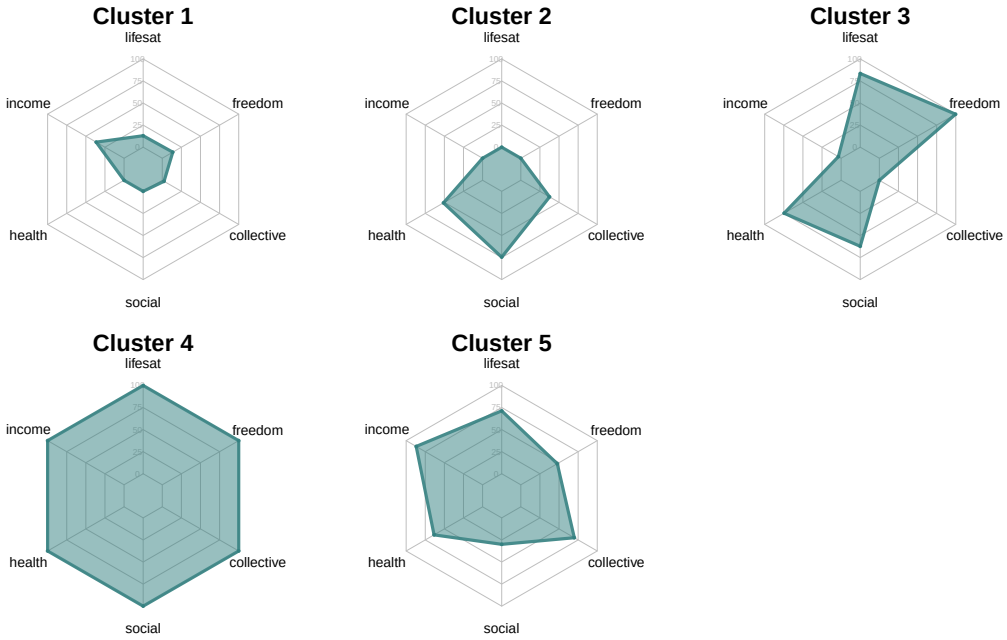

Figure 2.3: Variables' relative values across clusters

Cluster 1 consists of countries with low relative levels of life satisfaction and all its main determinants. In particular, these countries have the lowest levels of health, social ties, and, along with $C3$, collective social capital; and the second lowest freedom and life satisfaction indicators. However, the income level is not as low as in $C2$ and $C3$.

Cluster 2 consists of countries with low relative levels of income, freedom, and life satisfaction, and high relative levels of social ties. In particular, these countries have the lowest levels of income, freedom, and life satisfaction. On the other hand, they fare better in terms of health, collective social capital, and especially social ties, in terms of which indicator these countries rank second.

Cluster 3 is composed of countries with high levels of health, social ties, freedom, and life satisfaction, and low levels of income and collective social capital. Thus, these countries rank first, along with $C4$, in terms of the indicator of freedom; second in terms of indicators of health and life satisfaction; and third in terms of the indicator of social social ties. On the other hand, these countries have the lowest levels of income (along with $C2$) and collective social capital (along with $C1$).

Cluster 4 consists of countries with high levels of life satisfaction and all its main determinants. In fact, these countries rank first in terms of all clustering indicators.

Finally, cluster 5 consists of countries with high levels of income, health, collective social capital, and life satisfaction, and low levels of social ties. In particular, these countries rank second in terms of the indicators of income and collective social

capital. Moreover, they have the third highest levels of health and life satisfaction. They also rank third in terms of the indicator of freedom, although in this case the gap with respect to $C4$ and $C3$ is larger. On the other hand, these countries have the second poorest indicator of social ties.

2.4.2 The life satisfaction taxonomy in relation to an external classification

We may now analyze the resulting taxonomy in relation to some previous partial classifications carried out within the subjective well-being literature. Comparing the clustering structure derived from cluster analysis with an external structure derived from previous empirical studies may allow us to discuss both kinds of structure, one at the light of the other.

It is well-established, within the subjective well-being literature, that Latin America and the Caribbean and Confucian Asia constitute two regions that display two special subjective well-being patterns: countries from Latin America and the Caribbean have higher levels of subjective well-being than those their average life conditions would suggest (Helliwell, 2003; Helliwell & Wang, 2013; Inglehart et al., 2008; Rojas, 2018);[22] and countries from East Asia are in the opposite case (Helliwell & Wang, 2013) –this finding has been associated with the Confucian culture that is prevalent in China, Hong Kong, Vietnam, Singapore, Korea, and Japan (Ng, 2002; Weiming, 2019).

Inglehart et al. (2008) also found that ex-communist countries constituted a distinguishable life satisfaction country group. In particular, these countries exhibited levels of subjective well-being below those expected on the basis of their income levels. It must be noted, however, that recent evidence suggests that this country group may be vanishing (Guriev & Melnikov, 2018). Moreover, the divergent paths followed by countries from Central and Eastern Europe, on the one hand, and those from the Commonwealth of Independent States, on the other, suggest to distinguish among these two country groups, as is done in the *World Happiness Report* (Helliwell & Wang, 2013).

Despite the *World Happiness Report* classification of countries is not directly based on subjective well-being criteria, but on geographical and cultural reasons, it is worth relying on it to get a complete classification of countries. The World Happiness

[22]Rojas (2018) points out rightly that it would be more appropriate to distinguish Latin America from those Caribbean countries without a Spanish or Portuguese heritage. However, taking into account that the only country in the sample that does not fit this criterion is Trinidad and Tobago and following standard practice we stick in this paper to the Latin America and the Caribbean category.

Report classification has the appealing of including generally more compact country groups than other classifications, but for the case of Scandinavia, which constitute a separate group in Helliwell (2003) whereas is part of Western Europe in the *World Happiness Report*.

Relying on the previous findings and proposals we consider an external classification constituted by 11 country groups or classes: Western Europe, Scandinavia, Central and Eastern Europe, the Commonwealth of Independent States (CIS), South Asia, Southeast Asia, Confucian Asia, Latin America and the Caribbean (LAC), North America, Australia and New Zealand (NAANZ), the Middle East and North Africa (MENA), and Sub-Saharan Africa.

There is an external validity measure that assesses how closely a taxonomy reflects an external classification: the F-measure, which evaluates whether a hierarchical clustering contains, for each externally defined class, at least one cluster that is relatively pure –i.e., includes few countries of other classes– and includes most of the objects of that class (Tan et al., 2006). The overall F-measure is a weighted average of the F-measures associated with the different country classes:

$$F = \sum_j \frac{m_j}{m} F(j),$$

where m_j is the number of countries of class j, m is the total number of countries, and $F(j)$ is the F-measure associated with the country class j. $F(j)$ is computed as the maximum F-measure associated with class j over the whole set of nested clusters, where the F-measure associated with class j of a given cluster is a ratio that combines the precision (the fraction of the cluster that consists of countries of class j) and recall (the fraction of countries of class j included in the cluster):

$$F(j) = \max_i F(i,j) = \max_i \frac{2 \times precision(i,j) \times recall(i,j)}{precision(i,j) + recall(i,j)},$$

where the maximum is taken over all clusters i at all levels. $precision(i,j) = m_{ij}/m_i$, where m_{ij} is the number of countries of class j in cluster i, and m_i is the total number of countries in cluster i. Finally, $recall(i,j) = m_{ij}/m_j$.

The F-measure takes value 1 when all countries of class j are included in a cluster and no country of a different class is included in the same cluster. The F-measure tends to 0 when the fraction of a cluster that consists of countries of class j or the fraction of countries of class j in the cluster tends to zero. We are not as much interested in the overall F-measure as in the F-measures associated with the different country classes, especially those that have been established on the basis of subjec-

tive well-being criteria: LAC, Confucian Asia, Central and Eastern Europe, CIS, NAANZ, and Scandinavia. Table 2.3 top panel shows that the taxonomy presents in general large F-measures. In particular, the F-measures associated with NAANZ, LAC, Scandinavia, and South Asia, with values over 0.75.[23] The F-measures associated with Central and Eastern Europe, Confucian Asia, Western Europe, and CIS take values over 0.55.

The F-measures evaluate the overall taxonomy. Regarding the final five-cluster solution, it is worth assessing whether for each externally defined class there is any cluster with a high recall, as previously defined. It may be considered a good quality of the final five-cluster solution to group together most countries from a given geocultural region, especially in those cases in which the geocultural region has been shown to present special subjective well-being patterns.[24] As compared to the F-measures, recall does not penalize the possible lack of purity. Table 2.3 bottom panel shows that all countries from Scandinavia and NAANZ end up in $C4$. Similarly, all countries from South Asia end up in $C2$. Note that countries from these three categories are grouped together in the early stages of the hierarchical clustering procedure as shown by their associated F-measures.

Interestingly, all countries from Confucian Asia end up in $C5$. In this case, the associated F-measure indicates that the fusion of a significant fraction of those countries occurs in the last stages of the clustering procedure. Figure 2.1 shows that China, Hong Kong and Vietnam are grouped together very early, whereas Singapore, Korea and Japan follow another path along with countries from other regions and only merge with the rest of Confucian countries at the end of the clustering procedure. We may distinguish thus two subclusters. Table A.8 shows that the subcluster including China, Hong Kong and Vietnam (5.1) lies behind the other one (5.2) in most domains, but for the case of self-perceived freedom, which shows a similar value in both subclusters, and collective social capital, which is particularly high in Subcluster 5.1. A major difference between the two subclusters concerns the variable social ties, which is remarkably low in Subcluster 5.1.[25]

Most countries from LAC are grouped together in the early stages of the clustering procedure. Figure 2.1 shows that subsequently El Salvador merges with them

[23]It can be checked in Figure 2.1 that countries from those regions are grouped together in the early stages of the hierarchical clustering procedure

[24]Given that the clustering structure and the external structure are unbalanced –and moreover the external structure is not completely based on subjective well-being criteria– we do not attend to the correspondence between the resulting country clusters and the external country classification as assessed by different measures (e.g., entropy, purity, Rand statistic, and Jaccard coefficient).

[25]Table A.1 shows that the value of this variable for the subcluster including Singapore, Korea and Japan is representative of these three countries.

Table 2.3: External validity measures for country clusters

	Western Europe	Scandinavia	Cent-East Europe	CIS	South Asia	Southeast Asia	Confucian Asia	LAC	NAANZ	MENA	Sub-Sahar. Africa
F-measure (F = 0.606)	0.595	0.833	0.606	0.556	0.75	0.444	0.6	0.833	0.857	0.444	0.412
Recall											
C1	0	0	**0.588**	**0.5**	0	0	0	0.071	0	0	0
C2	0	0	0.235	0.2	**1**	0	0	0	0	**0.5**	**0.636**
C3	0	0	0.059	0.1	0	**0.5**	0	**0.786**	0	0.071	0.273
C4	0.267	**1**	0	0.1	0	0.25	0	0.071	**1**	0.214	0
C5	**0.733**	0	0.118	0.1	0	0.25	**1**	0.071	0	0.214	0.091

Source: Authors.
Data: WVS (2015), EVS (2015) and World Bank (2018).
Notes: CIS: Commonwealth of Independent States; LAC: Latin America and the Caribbean; NAANZ: North America, Australia, and New Zealand; MENA: Middle East and North Africa. External country classification based on Helliwell & Wang (2013), Helliwell (2003) regarding Scandinavia, and Ng (2002) and Weiming (2019) regarding Confucian Asia.

at the end of the clustering procedure into $C3$. It is apparent from Figure 2.1 that most countries from LAC constitute a subcluster within $C3$. Table A.8 shows that the LAC subcluster (3.1) shows higher levels of income, freedom, and life satisfaction than the other one (3.2), which shows higher levels of social ties and collective social capital than the LAC subcluster. On the other hand, there are three countries –Peru, Uruguay, and Chile– that are not grouped together with the rest of Latin American countries. Peru, with low levels of both social ties and collective social capital, is included in $C1$. Uruguay, with higher levels of collective social capital, is included in $C4$. And Chile, which also displays a higher level of collective social capital, is included in $C5$.[26]

Regarding the two ex-communist groups of countries –Central and Eastern Europe and CIS–, we can see that an important fraction of both groups are merged in the early stages of the clustering procedure forming, as shown in Figure 2.1, two separate subclusters that eventually merge into $C1$. Interestingly, there are three countries from Eastern Europe: Latvia, Lithuania, and Bulgaria, which are included in the CIS subcluster. As shown in Table A.8, both subclusters present similar patterns, but the one corresponding to Central and Eastern Europe (1.1) outperforms the CIS one (1.2) in most of the domains. Interestingly, both subclusters present similar values in the indicators of social ties and collective social capital.

On the other hand, it must be noted that as much as a 40% of the countries from Central and Eastern Europe, and a 50% from the CIS, are scattered over the rest of the clusters. Thus, four Balkan countries (Albania, Bosnia and Herzegovina, Serbia, and Macedonia) and two Caucasian countries (Azerbaijan and Georgia) are included in $C2$. Besides, one Balkan country (Montenegro) and one Central Asia former Soviet republic (Kyrgyzstan) are included in $C3$. Another country from Central Asia (Uzbekistan) is included in $C4$, within a subcluster mostly consisting of countries from Scandinavia. Finally, two Balkan countries (Slovenia and Kosovo) and one country from Central Asia (Kazakhstan) are part of $C5$.

Western European countries concentrate in $C4$ and, especially, $C5$, where more than the 70% of them are included. Regarding Southeast Asia, Indonesia and Philippines are included in $C3$; Malaysia in $C4$; and Thailand in $C5$. Finally, over half of the countries from both MENA and Sub-Saharan Africa are included in $C2$. An important fraction of countries from MENA spread over $C4$ and $C5$; whereas a relevant fraction of countries from Sub-Saharan Africa is included in $C3$.

[26]Data at the country level can be found in Table A.1.

2.4.3 Robustness checks

Ultimately, the goal of cluster analysis is to provide classifications that are reasonably "objective" and "stable" (Everitt et al., 2011): objective in the sense that the analysis of the same set of countries by the same numerical methods produces similar classification; and stable in that the classification remains similar when new countries or new characteristics describing them are added. In this section we check firstly whether the clustering is affected by the order of the data set. Secondly, we check whether the resulting five-cluster solution is reasonably robust to the clustering method. In particular we compare two different clustering methods: k-means and k-medoids.

Firstly, the resulting taxonomy is robust to the order of the data set. The original data set is ordered according to countries ISO numeric codes, which basically follow an alphabetical order. When the data set is rearranged randomly, the resulting taxonomy remains the same.

Regarding the clustering method, K-means is a widely used clustering method with continuous data which produces a partition of the sample of countries into a specified number, k, of groups by, starting with an initial discretionary selection of k data points (centroids), iteratively updating the partition by relocating each country to the group to whose centroid it is closest and then recalculating the centroids as the group means until no country change clusters. It can be shown that, when Euclidean distances are used to define "closeness" and under some regularity conditions, the reallocation criterion is equivalent to minimizing the sum of the within-group sums of squares, over all the variables, or, equivalently, the sum of the squared Euclidean distances between countries and their group mean (Everitt et al., 2011).

J. Ward (1963) first used this criterion in the context of hierarchical clustering (Everitt et al., 2011). It must be noted that agglomerative hierarchical clustering tends to make good local decisions about combining two clusters since it can use information about the pairwise similarity of all points. However, once a decision is made to merge two clusters, it cannot be undone at a later time—all merges are final. Thus, hierarchical clustering cannot be viewed as globally optimizing an objective function (Tan et al., 2006). Once the number of clusters has been specified, K-means aims at globally optimizing an objective function, although this method can only guarantee local optima given that the final result depends on the discretionary selection of the initial centroids. The so-called initialization problem may be partially addressed performing multiple runs of the clustering algorithm, each with a different set of randomly chosen initial centroids.

K-medoid is a robust alternative to k-means clustering. It is less sensitive to noise

and outliers, compared to k-means, because it uses exemplars (medoids) as cluster centers instead of means (Everitt et al., 2011; Kassambara, 2017). In contrast to the group means (centroids), the group exemplars (medoids) correspond to actual objects in the data set. In what follows we run K-means and PAM (*partitioning around medoids*, L. Kaufman and Rousseeuw, 1990) algorithms using R version 3.6.1 (R Core Team, 2018) package *factoextra* (Kassambara & Mundt, 2019). We set $k = 5$ as the number of clusters on the basis of the hierarchical clustering, and a number of reboots equal to 500 to address the initialization problem.

Before comparing the life satisfaction clusters resulting from the three different clustering methods we compare the performance of these methods in terms of two internal validity measures: the silhouette coefficient and the Dunn index. Both measures combine the two aspects that characterize a good clustering: compactness and separation. If a cluster is compact, it means that homogeneous observations are grouped together, and within-cluster variation is minimized. Where clusters are well separated, the between-cluster variation is maximized (Strauss & Maltitz, 2017). The Dunn index is defined as the ratio of the smallest between-cluster distance and the largest within-cluster distance, therefore a high value on this index is desired.

The silhouette coefficient is computed for each single object (country) as follows:

$$S(i) = \frac{b_i - a_i}{\max(b_i, a_i)},$$

where a_i refers to the average distance between country i and all other countries in the same cluster and b_i is the average distance between country i and all countries in the closest of the other clusters (as measured by such average distance). The overall silhouette coefficient is calculated as the average silhouette coefficient over all countries and takes values between -1 and 1. A larger silhouette coefficient is indicative of a better clustering.

Table 2.4 shows that the clustering produced by the K-means algorithm performs slightly better in terms of the silhouette coefficient as compared to the hierarchical procedure. However the latter outperforms clearly the other two clustering methods in terms of the Dunn index.

Regarding the robustness of the five-cluster solution, only 12 countries change clusters when we use K-means as clustering method. This number rises to 26 when we use the K-medoid clustering technique. Table 2.5 shows the countries that are grouped together under the three different clustering methods. Maybe the most notable aspect concerns $C3$, where non-changing countries are all, but Montenegro, from LAC. The rest of the clusters are reasonably robust in terms of the regions

of origin of the non-changing countries that comprise them. Thus, $C1$ is still comprised by ex-communist countries from both Central and Eastern Europe and CIS. $C2$ includes mainly countries from MENA, sub-Saharan Africa, and South Asia. $C4$ emerges as a very robust cluster: Uruguay is the only country that changes cluster depending on the clustering method. Finally, there is still a concentration of countries in $C5$ in Western (continental) Europe, and Central and East Asia.

Table 2.4: Comparison of internal validity measures of different clustering methods

	Silhouette width	Dunn index
Hierarchical	0.217	0.182
K-means	0.225	0.158
K-medoid	0.192	0.136

Source: Authors.
Data: WVS (2015), EVS (2015) and World Bank (2018).

Table A.9 shows those countries that may be considered at the boundary of the clusters and how they are clustered by the different clustering methods. The K-medoid algorithm removes several Eastern European countries and Peru from $C1$ and includes them in $C2$, but for the case of Czechia, which is included both by K-means and K-medoid algorithms in $C5$. Moreover, several countries from South Asia, MENA, and sub-Saharan Africa, apart from three ex-communist countries, are included by the K-medoid algorithm in $C1$ instead of $C2$. And, among other countries, two island countries from Southeast Asia are included in $C2$ instead of $C3$. As a result, it must be noted that both $C1$ and $C2$ resulting from the K-medoid algorithm are more heterogeneous in terms of the regions of origin of the countries that comprise them than using hierarchical and K-means clustering techniques. On the other hand, $C3$ resulting from the K-medoid algorithm is much more homogeneous as all countries but Montenegro are from LAC.

2.5 Conclusions

Cross-country subjective well-being research has focused so far on the estimation of regression models trying to explain the distribution of average levels of subjective well-being across countries. These regression analyses have identified the main determinants of average life evaluations. However, the different aspects considered in the analyses (average life evaluations and their determinants) are jointly determined along time and therefore different typical combinations of values of the variables may

Table 2.5: Countries that do not change their cluster allocation

C1	C2	C3	C4	C5
Armenia	Algeria	Argentina	Australia	Bahrain
Bulgaria	Bosnia-Herzegovina	Brazil	Canada	Belgium
Belarus	Ethiopia	Colombia	Cyprus	Chile
Estonia	India	Dominican Republic	Denmark	China
Hungary	Mali	Ecuador	Finland	France
Latvia	Morocco	El Salvador	Iceland	Germany
Lithuania	Zimbabwe	Guatemala	Ireland	Greece
Moldova	Tunisia	Mexico	Jordan	Hong Kong
Russia	Turkey	Montenegro	Kuwait	Iran
Ukraine	Uganda	Trinidad and Tobago	Malaysia	Italy
	Macedonia	Venezuela	New Zealand	Japan
	Yemen		Norway	Kazakhstan
			Qatar	Korea
			Sweden	Portugal
			Switzerland	Viet Nam
			United Kingdom	South Africa
			United States	Spain
			Uzbekistan	Thailand

Source: Authors.
Notes: Clustering methods: hierarchical (Ward's method), k-means, and k-medoid.

appear. In this regard, previous literature on the distribution of average life evaluations across countries has found that there are at least three groups of countries that show special life evaluation patterns: Latin America and the Caribbean, Confucian countries, and the ex-communist countries.

In this paper we have carried out a hierarchical cluster analysis on 103 countries. We use as clustering variables the average level of life satisfaction as well as proxies for five of its main determinants: the average levels of income, health, social support and sociality, collective social capital, and freedom. Cluster analysis is a suitable method for discovering patterns in data and classifying objects. A crucial feature of cluster analysis is that it groups countries only on the basis of the information found in the data set. Consequently, we have chosen the clustering variables after a thoroughly discussion on the determinants of average life evaluations. Moreover, we have subsequently compared the resulting hierarchical clustering with an external classification of countries derived from findings of the previous research.

We have identified five clusters of countries:

$C1$ is constituted by countries that perform poorly in all the six domains, being especially noteworthy their low levels of social ties and collective social capital.

All the countries included in $C1$ are ex-communist countries, but for the case of Peru. Interestingly, the taxonomy identifies two subclusters within $C1$. One consists mostly of countries from the European side of the CIS, whereas the other one consists of countries from Central and Eastern Europe. The latter outperforms the former in most of the domains, thus seemingly reflecting the different paths followed by these two groups of countries since the 90s (Helliwell, 2003). Moreover, it must be noted that an important fraction of countries from both CIS and Central and Eastern Europe are scattered over the rest of clusters. In particular, most countries from the Balkans and the Caucasus, and all from Central Asia are included in other clusters. In sum, the taxonomy suggest that the group of ex-communist countries still constitutes a life satisfaction cluster (Inglehart et al., 2008), although two important remarks should be done. First, countries from the Balkans, the Caucasus, and Central Asia are markedly different. Second, the taxonomy somehow reflects the changes that may be operating in the group of ex-communist countries (Guriev & Melnikov, 2018).

$C2$ seems to be constituted by traditional societies with the capacity of providing social capital and health, though lacking other important sources of life satisfaction such as income and freedom. This group consists of countries from North and East Africa, the Balkans, the Middle East, and South Asia.

$C3$ is also characterized by low levels of income (although it includes a sizeable set of middle income countries). Moreover, $C3$ also has a markedly low level of collective social capital. However, contrary to $C1$ and $C2$, this cluster displays a very high level of self-perceived freedom, which may explain its also high level of average life satisfaction. Countries from Latin America and the Caribbean constitute the core of this cluster, although there are some important deviant countries: Peru is included in $C1$, Uruguay is included in $C4$, and Chile is included in $C5$. These results match previous findings about this region (Helliwell, 2003; Helliwell & Wang, 2013; Inglehart et al., 2008; Rojas, 2018), although they suggest that the region is not completely homogeneous and question the role of social support and sociality as the key feature of the cluster. On the other hand, as was already noted by Inglehart et al. (2008), a key feature of this cluster is its high level of self-perceived freedom.

$C4$ is constituted by thriving societies that, as a group, show the highest values in all of the variables. We may think that the main characteristics of the cluster are the high levels of social ties, collective social capital, and freedom. This cluster consists mainly of countries from the anglosphere and Scandinavia, although there is a bunch of countries from other regions. This result matches also previous findings (Helliwell, 2003; Helliwell & Wang, 2013).

Finally, $C5$ is also mostly constituted by countries with high levels of income and collective social capital. However, this cluster has low levels of social ties and freedom, as compared to $C4$. These may be the two main features of the cluster, and what may explain the connection between countries from Western (continental) Europe and Confucian countries from East Asia. Other important countries included in $C5$ are Chile, South Africa, Iran, and Kazakhstan. Regarding the compactness of the Confucian countries –a potential subcluster (Ng, 2002)– we have seen that, in fact, Singapore, Korea, and Japan are closer to countries from other regions than to China, Honk Kong, and Vietnam, which show higher levels of collective social capital and lower levels of social ties.

Overall, the comparison between the resulting taxonomy and the external classification of countries based on previous findings is encouraging as the taxonomy reflects some key aspects of the latter. Moreover, we have seen that the resulting five-cluster solution is rather robust to the clustering method. However, the life satisfaction taxonomy presented in this paper is only preliminary. The quality of the clustering may be likely improved using better proxies for the different determinants of life satisfaction. We may think, particularly, that the indicator used as a proxy for social support and sociality, the importance given to the family and friends, albeit measuring values or norms associated with social support and sociality, may be likely improved with more specific and less prone to conformity bias measures. Additionally, it would be interesting to use a more objective measure of health.

Moreover, future research should focus on the implications of the classification. On the one hand, we may have to look for differences between clusters in terms of the distribution of life satisfaction within countries, the evolution of such distribution and its determinants. Besides, it may be interesting to check whether the consequences of changes in average life satisfaction or any of its determinants vary across clusters. Thus, it is well-established that the inter-relations among the different factors affecting subjective well-being are very strong and, in many cases, there may be multiplying effects (Stiglitz et al., 2018). Recognising those inter-relations is therefore very important and cluster analysis may play an important role. In this regard, we note that Ireland and Iceland, which have been found strongly resilient to sever economic upheavals (Helliwell et al., 2015), are both included in $C4$, whereas Greece, which resiliency was found weaker in the same study, is included in $C5$. More evidence in this regard –along with a convincing explaining theory– is needed to derive further implications from the classification.

Chapter 3

Social foundations of happiness: Developing a country typology*

3.1 Introduction

One of the most celebrated definitions of the human being refers to its political condition: "man is by nature a political animal" (Aristotle, *Politics*, 1253a). According to Aristotle, the good life requires an appropriate political organization. And within the political community he stressed the importance of the family and friends;[1] thus being natural that the original definition is often rewritten as "man is by nature a social animal." Nowadays, the special importance of the social dimension of life for people's well-being is well-established in the literature (see, for instance, E. Diener and Seligman, 2004, Helliwell et al., 2017, and Helliwell et al., 2020).

Helliwell et al. (2017) introduced the concept of "social foundations of happiness" to encompass all the different aspects concerning the social dimension of life –from personal relationships to public institutions– that explain the distribution of mean life evaluations across countries. In particular, they consider four major aspects of the social environment: social support, freedom to make life choices, generosity, and trust and good governance. Evidence suggests that these four aspects exert independent effects on average life evaluations and that the most important in this regard are social support and freedom to make life choices. Together, the four social context aspects account for around half of the explained variation in mean life evaluations (the other half being accounted for by the average levels of income and health).

Importantly, the different social aspects are likely interwoven in a complex man-

*This chapter corresponds to an unpublished paper written along with Adolfo C. Fernández.

[1]Refer to the ethical works of the Greek philosopher.

ner. For instance, it has been pointed out that there may be a trade-off between freedom to make life choices and social support. Thus, greater freedom might come at the expense of the available level of social support (E. Diener, Diener, & Diener, 1995; Helliwell et al., 2017). In this regard, at the individual level, Alesina and Giuliano (2010) show that the strength of family ties, arguably one of the main sources of social support,[2] is negatively associated with women's labor force participation, an indicator of gender equality and therefore of individual freedom. Friends are another source of social support. Pugno and Verme (2012) distinguish three cases attending to the relationship between the strength of family ties and the strength of friendship ties, as measured by the importance given to family and friends respectively: individuals with stronger family ties, individuals with stronger friendship ties, and those with balanced family and friendship ties. Their results suggest that those with balanced family and friendship ties report on average higher life satisfaction.

Regarding trust, it has been linked to societies with greater individual freedom. Thus, it has been found that economic freedom (as measured by an indicator of the legal structure and security of property rights) enhances social trust (Berggren & Jordahl, 2006).[3] Furthermore, it has been also consistently found that collectivism –a cultural trait that emphasizes group goals as opposed to individual goals and thus concerns the extent of individual freedom (E. Diener, Diener, & Diener, 1995)– is negatively associated with social trust (Macy & Sato, 2002; van Hoorn, 2014). This relationship is not obvious as we may expect societies with stronger group obligations –and therefore less freedom to make life choices– to be more cooperative and trusty. Macy and Sato (2002) suggest that interpersonal trust does not only depend on the strength of group obligations but also on the level of social and spatial mobility that requires individuals to learn how to interact effectively with strangers. According to the authors too much mobility may diminish interpersonal trust, but until a certain threshold it may actually enhance it.

However, it must be noted that there may be differences among collectivistic cultures. In this regard, Delhey and Newton (2005) point out that Confucianism (a canonical collectivistic culture) may enhance interpersonal trust; and in fact their country-level data on interpersonal trust points in that direction with China classified as a high-trust society, and Japan and South Korea as medium-trust societies. Otherwise, trust is apparently more clearly associated with generosity or altruism.

[2]In the working paper they found that the strength of family ties was positively associated with happiness and life satisfaction, as would be expected from a source of social support (Alesina & Giuliano, 2007).

[3]However, it must be noted that Bjørnskov (2007) do not find a significant effect using a larger sample and similar controls.

Thus, Falk et al. (2018) show that countries with higher levels of social trust tend to show also higher levels of altruism. It is argued that both aspects "describe positive behavioral dispositions toward others" (p. 1665).

The seemingly complex interrelationships between the different aspects concerning the social dimension of life encourage searching for possible patterns in their joint distribution:[4] are there different typical configurations of the social foundations of happiness across countries? The findings discussed above point to several bivariate relationships that may be study as part of a more general multivariate analysis. In particular, in this paper we carry out a hierarchical cluster analysis over six classification variables –social support, family ties, friendship ties, tolerance of out-groups, generosity, and collective social capital– concerning four major social context aspects: social support and sociality, individual freedom, altruism, and trust and good governance. The analysis aims at discovering patterns in the data and grouping similar countries together.

The contribution of this chapter is two-fold. First, we carry out a thoroughly discussion of the concept of social foundations of happiness and, on this basis, we select six indicators of the social context –which are moreover validated using several alternative measures drawn from different sources: World Values Survey, European Values Study, Gallup World Poll, Global Preference Survey, and the World Bank's Worldwide Governance Indicators–. Second, we propose a country typology based on the main characteristics of the social context that is conceptually sounding and informative. Overall, the proposed typology may be a useful reference to evaluate countries in terms of the social foundations of happiness.

Future research, apart from trying to improve the available data and the characterization of the social foundations of happiness, should check whether the typology is linked to differences in relevant outcomes and ultimately try to derive possible policy implications.

The rest of the chapter proceeds as follows. In Section 3.2 we thoroughly discuss the concept of social foundations of happiness and the different proxies used by previous research to account for them. Section 3.3 presents the method used in our research. Firstly we study alternative proxies for each of the social aspects considered and select those to be used in the subsequent analysis. Finally we describe the clustering method. In section 3.4 we present the main results and carry out some robustness checks. In Section 3.5 we discuss more extensively the resulting country typology. Section 3.6 concludes.

[4]For instance, Helliwell et al. (2020) point out that "The social environments influencing happiness are diverse and interwoven, and likely to differ within and among communities, nations and cultures" (p. 33).

3.2 Social foundations of happiness

The concept of social foundations of happiness refers to all the aspects concerning the social environment of individuals –from personal relationships to public institutions– that explain the distribution of subjective well-being across countries (Helliwell et al., 2017). Helliwell and Wang (2013) explanatory model of the world happiness accounts rather comprehensively for the social foundations of happiness. Consequently, we use it as benchmark to thoroughly discuss them. In particular, we first describe the different social factors accounted for in the model, introduce the measures used by the authors, and discuss the associated results. Then we discuss alternative theoretical and empirical approaches that extend the scope of the different social factors, propose alternative measures, or find other relevant evidence.

Helliwell and Wang (2013) explanatory model of the world happiness includes, along with the variables GDP per capita and healthy life expectancy at birth, four variables that proxy for different aspects of the social context: social support, freedom to make life choices, generosity, and absence of corruption in government and businesses. Their model has been consistently found to explain almost three-quarters of the variation in average life evaluations across countries and results suggest that the four social context variables explain around half of such explained variation.

Social support refers to a range of different kinds of help and advantages facilitated by people's social ties: emotional support, practical help, financial and material support, and information and advice (Scrivens & Smith, 2013). Helliwell et al.'s (2017) results suggest that social support –as measured by the proportion of individuals having someone to count on in times of trouble– is the most important single factor underlying the world distribution of happiness along with the income level. And their results could be conservative as the authors note that "having someone to count on is of fundamental importance, but having a fuller set of supporting friendships and social contacts must be even better" (Helliwell et al., 2017, p. 31).

According to Rojas (2018), close interpersonal relations are important not only in terms of emotional and material support but, more broadly, in terms of sharing daily life. In this regard, Bruni (2008) points out that genuine (non-instrumental) interpersonal relationships give rise to intrinsically valued "relational goods." Harlow and Cantor (1996) found that participation in community service activity and in daily life social activities –such as entertaining and visiting with friends and going to social and cultural events– was associated with greater life satisfaction in a sample of elderly people, after controlling for social support (as measured by being married and the frequency of contact with siblings and children), individual differences in personality traits, health status, and prior levels of life satisfaction.Powdthavee

(2008) found that socialising with family, friends, and neighbours –as measured by how often one meets friends or relatives and talk to one's neighbours– is positively associated with life satisfaction. Thus, we may refer more broadly to social support and sociality and not only to social support.

Freedom refers to people's ability to pursue their personal goals, which is expected to allow people to make progress in achieving them and thus, ultimately, to enhance their subjective well-being (E. Diener, Diener, & Diener, 1995). Freedom is measured by Helliwell et al. (2017) as the proportion of individuals satisfied with their freedom to choose what to do with their lives. Their results suggest that freedom to make life choices is the fourth most important factor underlying the distribution of average life evaluations across countries (after income, social support, and health). Inglehart et al. (2008), using a different databank, also found a strong positive association between the sense of freedom to make life choices and subjective well-being.

The sense of freedom to make life choices has been shown to be associated with economic growth and democratic governance –prosperity and political freedom– and, even more strongly, with the tolerance of out-groups that represent diverse lifestyles –social freedom– (Inglehart et al., 2008). In this regard, Schyns (1998) points out that freedom does not only entail civil and political rights, but more broadly the capacity of individuals to choose their own life course without being discriminated against. Inglehart et al. (2008) argue that "more open social norms concerning the role of women, ethnic diversity, and alternative lifestyles give people more freedom of choice in how to pursue happiness" (p. 271). Inglehart et al. (2008) use as a proxy for social freedom a variable that measures the tolerance of homosexuals and found that it is significantly associated with subjective well-being even after controlling for the average sense of freedom to make life choices. Schyns (1998) used a measure of gender equality as a proxy for freedom and found that it was linked with happiness among the richer countries of the sample even after accounting for their GDP per capita.

Importantly, Helliwell et al. (2017) point out that freedom and social support cover different but tightly related aspects of the social fabric. Thus, benefits associated with social support networks, e.g., "to feel that others care for [us] and will come to [our] aid when needed," may be the product of social norms that set "limits on each person's freedom to make life choices freely" (Helliwell et al., 2017, p. 32). In this regard, E. Diener, Diener, and Diener (1995) note that individual freedom is higher in individualistic societies in which individuals are oriented toward their personal goals and desires, as opposed to collectivistic societies in which the group is of

primary importance and therefore there might be greater feelings of social support.

This possible trade-off between individual freedom and social support may be linked to the concept of *locus of socialization* proposed by Pugno and Verme (2012). These authors find that proxies typically used for social capital tend to polarize around two dimensions interpreted as bonding and bridging. Bonding social capital emerges when relations of trust and cooperation are restricted within groups (among members of a family, religious group, etc.), whereas bridging social capital emerges when linkages between groups arise. The point is that exclusive bonding may be a barrier to individual freedom. For instance, OECD (2001) points out that "exclusive ethnic ties [within immigrant groups] can impede individuals in expanding their contacts with a wider network" (p. 42), and Alesina and Giuliano (2010) show that strong family ties are associated with a lower women's labour force participation (who are tied to a more "traditional" housewife role) and lower geographical mobility. Interestingly, Pugno and Verme's (2012) results indicate that people with extreme bonding or bridging attitudes are less happy than people with more balanced attitudes.

Generosity or altruism involves incurring costs for the benefit of others (Layard et al., 2012). Evidence suggests that giving support to other people might be at least as important as receiving it in terms of coping with stressors, longevity and subjective well-being (E. Diener & Seligman, 2004; Helliwell et al., 2017). The extent of generosity within a country is measured by Helliwell et al. (2017) as the proportion of donors to charities in the last month adjusted by the income per capita of the country. This measure is found significantly associated with countries' average life evaluations, albeit the estimated contribution is smaller than that of the previous two social context factors. Meier and Stutzer (2008) found that more regular volunteering increases the life satisfaction of individuals, especially if their life goals are intrinsic rather than extrinsic.[5] Similarly, Becchetti et al. (2017) find that voluntary and charity work increases the life satisfaction of individuals, but only if they carry out such activities for other-regarding motivations.[6]

[5]Meier and Stutzer (2008) consider that "people have different life goals. While some people are more extrinsically oriented ('materialists'), others put greater emphasis on intrinsic life goals. Materialists share the belief that acquisition and possession are central goals on the path to happiness ... In contrast, people with intrinsic life goals emphasize personal growth, relationships and community spirit as important sources of wellbeing" (p. 53). Regarding intrinsic life goals, Meier and Stutzer focus on relational goals. Thus, they measure the relative importance of materialistic goals as the average importance given to income and career success as compared with (divided by) the average importance given to family and friends.

[6]Using data from the Survey of Health, Ageing, and Retirement in Europe (SHARE), Becchetti et al. (2017) classify as other-regarding motivations rationales such as "I did it because I'm needed" or "to contribute to something useful." On the other hand, they classify as self-regarding motivations rationales such as "I did it to earn money," "to meet friends," "to use skills," and "to

Finally, the absence of corruption in government and business is an important aspect of what may be referred to as social trust and good governance (Helliwell et al., 2017) or collective social capital (Scrivens & Smith, 2013).[7] This social context aspect concerns the community or the larger society, thus the relations of individuals with each other, the civil society organizations, businesses, and public institutions. An important intangible component of this dimension are norms of civic cooperation, which act as constraints on narrow self-interest thus reducing transaction costs and realising resources for more valuable purposes (Knack & Keefer, 1997). Moreover, norms of civic cooperation increase generalized trust, which replaces suspicion and fear (Helliwell, 2003), and some civic behaviours, such as politeness, may give rise to relational goods (Bruni, 2008). Seemingly considering this community dimension, Clark et al. (2017) point out that "each of us ... has a marked impact on the happiness of other people" (p. 132).

Helliwell et al.'s (2017) proxy for social trust and good governance –the average of the binary answers to two Gallup World Poll questions on whether corruption is widespread throughout the government and the business– emerges significantly associated with countries' average life evaluations, although it lies at the bottom of the ranking of contributions, along with generosity. Arguably, the size of the estimated association is conservative as they lack specific measures of social trust and confidence in institutions. Moreover, good governance involves other aspects beyond the absence of corruption.

Social trust –as measured by reporting the belief that most people can be trusted– has been consistently found largely correlated with life satisfaction (Dolan et al., 2008). In addition to the effect of social trust, trust in several public institutions: police, legal system, parliament, and politicians, have been found to contribute independently to life satisfaction in a European sample (Helliwell et al., 2017). In that research, the two most important sorts of trust were social trust and trust in police. Finally, some evidence suggests a large positive association between the existence of a lively civil society (as measured by the national average membership in all types of non-religious organizations) and the life satisfaction of individuals (Helliwell, 2003).

Regarding good governance, Helliwell et al. (2017) distinguish two major aspects: on the one hand, the formal structure of national institutions (e.g., parliament, courts, or electoral systems) as it concerns the presence and pervasiveness of key features of democratic electoral elections and representation. This aspect is

keep fit."

[7]Although it must be noted that Scrivens and Smith (2013) exclude good governance from their definition of collective social capital.

referred to as the *quality of democracy*. On the other hand, there is the reliability and responsiveness of governments in their design and delivery of services (e.g., education, or health assistance), which are referred to as the *quality of delivery* and reflect the ability of a society to care for people.

Evidence suggests that the quality of delivery –as measured by an index that combines four World Bank's indicators of governmental quality (D. Kaufman et al., 2009): effectiveness, rule of law, quality of regulation, and control of corruption– is strongly associated with average life evaluations, while the quality of democracy –as measured by an index that combines the two remaining World Bank's indicators: voice and accountability and political stability and absence of violence– is not once controlling for the quality of delivery (Helliwell et al., 2019). In line with this, strong welfare states and public spending have been found to enhance average subjective well-being (Blanchflower & Oswald, 2011), at least for some important social groups (Bjørnskov et al., 2008) and as far as they involve some specific areas such as healthcare (Helliwell et al., 2019).

One important aspect of the community and the larger society is political and social stability (E. Diener & Seligman, 2004). In this regard, Bjørnskov et al. (2008) interpret their finding on the significant positive link between a bicameral political system and life satisfaction as the effect of a system that with its checks and balances allows stability. However, Helliwell et al.'s (2019) results –their index of democratic quality includes a measure of political stability and absence of violence that fails to be significantly associated with average life evaluations– suggest that the effect of political and social stability may be mediated (or confounded) by the quality of delivery.

Summing up, social support and sociality, individual freedom, altruism, and social trust and good governance constitute important aspects of the social foundations of happiness. Given the strong inter-relations that seemingly exist between the different components of the social context in the remaining of the paper we use a method of analysis suitable for discovering possible patterns in the data at the cross-country level.

3.3 Method

3.3.1 Data

Before proceeding with the cluster analysis, in this section we present some alternative indicators for each of the social dimensions considered and study their intercorrelations. The goal is to allow a *prima facie* assessment of the validity of the

different measures and support the final selection of six indicators.

We use data from the Integrated Values Survey 1981-2014 (IVS), which merges data of the World Values Survey (WVS, 2015) and the European Values Study (EVS, 2015). As noted in the previous chapter, this family of studies has collected data about beliefs, values, and attitudes of individuals for nationally representative samples of 109 countries around the world since 1981. Besides, we use country-level data concerning the social context provided by Helliwell et al. (2019), who use micro-data collected by the Gallup World Poll since 2005 for nationally representative samples of more than 150 countries. In the present section we additionally use data from other sources that would be described as we introduce the measures provided by them.

All indicators but those drawn from Helliwell et al. (2019) are based on individual level data that is aggregated using the original weights provided by the survey to get unbiased estimations of countries' average values. Moreover, following standard practice we compute averages by country using all the available rounds of the different surveys. This procedure may cancel out fluctuations due to non-lasting events, such as economic crises.[8] It must be noted however that not all the countries participate in all the rounds of the WVS, thus we have for instance countries in the sample which data was collected in the nineties or which last participation was in 2008, whereas other countries have participated continuously along all the rounds of the survey.

Regarding **social support and sociality**, we may distinguish three kinds of indicators as they concern the structure (tangible components), social norms (intangible components), or outcomes of people's social relationships. A widely available indicator is the variable *social support* used by Helliwell et al. (2019), which measures the proportion of individuals in a country having someone to count on if they were in trouble. This is a positive outcome of social relationships mostly provided by family and friends. In what follows we present several indicators of the structure and social norms concerning these two sources of social support and sociality and discuss their possible implications.

Alesina and Giuliano (2010) constructed an index of family ties –*family ties (AG)*– that assesses values concerning the family. On the one hand, family ties may enhance social support and socialization but, on the other hand, they have been found to be negatively correlated with gender equality and thus, ultimately, individual freedom. The index comprises three different measures: first, the average

[8]See footnote 9 of Chapter 2 for a discussion on the implicit assumption of the stability of the social foundations of happiness.

importance attributed to the family on a scale that ranges from 0 (not important at all) to 3 (very important). Second, the proportion of respondents that agree with the statement: "It is the parents' duty to do their best for their children even at the expense of their own well-being" (as opposed to: "Parents have a life of their own and should not be asked to sacrifice their own well-being for the sake of their children"). And third, the proportion of individuals that agree with the statement: "Regardless of what the qualities and faults of one's parents are, one must always love and respect them" (as opposed to: "One does not have the duty to respect and love parents who have not earned it").

Similarly, Beytía (2016) and Rojas (2018) use the variable *making parents proud* –the average level of agreement with the statement "One of my main goals in life has been to make my parents proud"– to proxy for the values concerning the family in a country. The response scale ranges from 0 (strongly disagree) to 3 (Strongly agree). This question has been included in the WVS since its third wave, whereas two of the questions used in the construction of the index of family ties have not been included in the survey since the fourth wave (this is an important issue because many countries have participated in the survey only in the last two waves).

We additionally consider the variable *friendship ties*: the average importance given to friends on a scale that ranges from 0 (not important at all) to 3 (very important). This variable assesses a value concerning a potentially important source of social support that additionally has been found to account for a more open kind of sociality as compared with the strength of family ties (Pugno and Verme, 2012).

Finally, in its fourth round the WVS asked respondents about the frequency with which they spent time with their parents or other relatives and with friends. These variables (*meet family* and *meet friends*) are more objective measures concerning family and friendship relationships.

Table 3.1 shows the correlations between the different variables that assess the level of social support and sociality in a country. There are three remarkable results. First, the correlation between the variables *family ties (AG)* and *make parent proud* is very high. This suggests that, as was expected, they gauge the same phenomenon.

Second, the estimated correlation between *friendship ties* and *meet friends* is also very high, thus our proxy for the values concerning friendship is consistent with the reported behaviours. Surprisingly, the strength of family ties is only marginally correlated with the frequency with which individuals meet their parents or other relatives. However, it must be noted that the sample size for *meet family* is quite small.

Finally, rather unexpectedly, *family ties (AG)* emerges negatively correlated with

Table 3.1: Indicators of social support and sociality: Correlation matrix

		(1)	(2)	(3)	(4)	(5)	(6)
(1) Social support	Pearson	1					
	Spearman	1					
	N	106					
(2) Family ties (AG)	Person	-0.483***	1				
	Spearman	-0.575***	1				
	N	82	82				
(3) Make parents proud	Person	-0.501***	0.878***	1			
	Spearman	-0.558***	0.889***	1			
	N	94	71	94			
(4) Meet family	Person	-0.001	0.182	0.275*	1		
	Spearman	-0.022	0.217	0.299*	1		
	N	37	37	37	37		
(5) Friendship ties	Person	0.105	-0.108	-0.020	-0.071	1	
	Spearman	0.174*	-0.121	0.000	-0.043	1	
	N	105	82	94	37	105	
(6) Meet friends	Person	0.203*	-0.045	-0.009	-0.050	0.773***	1
	Spearman	0.241**	-0.067	0.010	-0.060	0.780***	1
	N	67	67	58	37	67	67

Source: Authors.
Data: Helliwell et al. (2019), WVS (2015), and EVS (2015).
Notes: See main text for the definition of the variables. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively.

social support, whereas there is a weak positive correlation between the latter and the proxies for the strength of friendship relationships (especially the more objective one: *meet friends*). Overall, these correlations suggest that perceived social support is driven by factors different from family and friendship ties. Moreover, the proxies for the strength of family and friendship relationships are uncorrelated.

Previous results encourage using at least three different measures to assess the social support and sociality dimension of the social context: the measure of social support, one proxy for the strength of family relationships, and another one for the strength of friendship relationships. Regarding friendship relationships, the variable *friendship ties*, which is highly correlated with *meet friends* and is available for most of the countries, will be used as a proxy for this kind of sociality in the subsequent analysis.

Regarding family life, the weak correlation found between the values or social norms concerning the family and the reported behaviours suggests that it may be interesting to control for both aspects –values concerning the family and reported

behaviours– separately, although the small sample size available for the variable *meet family* precludes it.

Moreover, changes in the questionnaire of the WVS along the years also limit the sample sizes available for the variables *family ties (AG)* and *make parents proud*. However, their strong correlation can be exploited to produce a more robust indicator that may additionally allow enlarging the sample size. In this regard, we first construct a new variable (*make parents proud+*) adding the variable *make parents proud* and one of the components of *family ties (AG)*: the importance given to the family, which data has been collected in all the rounds of the survey. The estimated Pearson correlation between the variables *make parents proud+* and *family ties (AG)* is 0.907 ($p<0.01$, $N = 71$). Then, we standardize these variables (z-standardization), and finally construct a new measure of the strength of family ties (*family ties*) as their arithmetic mean, and where data for one of the alternative measures is missing, the value of the other measure is used as the measure of *family ties*. This way the variable *family ties* is available for 105 countries. Table 3.2 shows that it correlates almost perfectly with its components.[9]

Table 3.2: Values concerning the family: correlations with alternative indicators

		Social support	Family ties (AG)	Make parents proud	Make parents proud+	Meet family
Family ties	Pearson	-0.470***	0.980***	0.953***	0.981***	0.224
	Spearman	-0.540***	0.972***	0.963***	0.982***	0.183
	N	105	82	94	94	37

Source: Authors.
Data: Helliwell et al. (2019), WVS (2015), and EVS (2015).
Notes: See main text for the definition of the variables. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively.

Individual freedom involves several aspects of the social foundations of happiness (Inglehart et al., 2008). Thus, we have previously argued that the variable *family ties* may partly gauge the extent of individual freedom. Otherwise, political-related freedoms concern the good governance domain. Moreover, individual freedom concerns social freedoms: equality and tolerance of out-groups. In this regard, Inglehart et al. (2008) use as a proxy for the overall tolerance of out-groups the proportion of respondents that do not select homosexuals as a group of people they would not like to have as neighbours (*Tolerance of out-groups*).

[9]Table B.1 in Appendix B shows the final dataset. It includes the variable *family ties*. We note those countries for which the variable reflect the standardized value of *family ties (AG)* or *make parents proud+*. There are a total of 22 countries for which we lack data for *family ties (AG)* and 11 countries for which we lack data for *make parents proud+*. In the robustness checks section we point out that the results are not much affected by this procedure.

Other usual proxies for individual freedom are indicators of gender equality and overall measures of (self-perceived) freedom. Inglehart and Welzel (2005), relying on data from the IVS, use as a proxy for gender equality the proportion of respondents that strongly disagree with the statement: "On the whole, men make better political leaders than women do." The IVS also includes a question concerning how much freedom of choice and control the respondent feels he or she has over the way his or her life turns out on a 10-point scale. Helliwell et al. (2017), relying on data from the Gallup World Poll, use as a proxy for freedom the proportion of individuals satisfied with their freedom to choose what they do with their life.

Table 3.3 shows the correlations between the different proxies for individual freedom. The variable *tolerance of out-groups* is strongly correlated with Inglehart and Welzel's (2005) indicator of gender equality and also with the overall measure of freedom used by Helliwell et al. (2017). Ideally, we would use as a proxy for individual freedom a comprehensive measure of social freedom comprising the variables *tolerance of out-groups* and *gender equality*; however, in order to maximize the sample size we focus on the former.

Table 3.3: Indicators of individual freedom: Correlation matrix

		(1)	(2)	(3)	(4)
(1) Tolerance of out-groups	Pearson	1			
	Spearman	1			
	N	103			
(2) Gender equality	Person	0.592***	1		
	Spearman	0.562***	1		
	N	92	94		
(3) Self-perceived freedom (IVS)	Person	0.386***	0.277***	1	
	Spearman	0.377***	0.263**	1	
	N	103	94	105	
(4) Self-perceived freedom (GWP)	Person	0.594***	0.399***	0.575***	1
	Spearman	0.604***	0.348***	0.593***	1
	N	102	94	104	105

Source: Authors.
Data: WVS (2015), EVS (2015), and Helliwell et al. (2019).
Notes: See main text for the definition of the variables. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively.

Altruism is measured by Helliwell et al. (2017) by means of the variable *generosity* (GWP): the proportion of donors to charities in the last month adjusted by the income per capita of the country. Recently, Falk et al. (2018) have carried out an international survey on economic preferences: the Global Preference Survey (GPS),

an experimentally validated survey data set that includes a measure of "pecuniary" altruism (*generosity GPS*). Their measure is constructed on the basis of two different items: a donation decision (the amount the respondent would donate in case of unexpectedly receiving 1,000 euros), with a weight of 0.635, and a self-assessment on one's willingness to give to good causes (without expecting anything in return) on an 11-point scale, with a weight of 0.365. Moreover, Falk et al. (2018), relying on the WVS, use as an alternative (more general) measure of altruism the average response to a question that assess how similar is the respondent to a hypothetical person for whom "it is important [...] to do something for the good of society" on a 6-point scale (*Socially minded*). Finally, relying on IVS data and following Becchetti et al. (2017), we can use as an additional measure of altruism the proportion of respondents in a country that are members of a humanitarian or charitable organization (*humanitarian*).

Table 3.4 shows that the correlations between the different proxies for the level of altruism in a country are not significantly different from zero but for the case of Helliwell et al.'s (2017) measure of generosity and the variable *humanitarian*, which emerge strongly correlated. Interestingly, these are the two most objective measures, in the sense that they gauge actual (self-reported) behaviours. In the subsequent analysis we would use the variable *generosity* (Helliwell et al., 2017) to maximize the sample size.

Table 3.4: Indicators of altruism: Correlation matrix

		(1)	(2)	(3)	(4)
	Pearson	1			
(1) Generosity (GWP)	Spearman	1			
	N	106			
	Pearson	0.080	1		
(2) Generosity (GPS)	Spearman	0.080	1		
	N	63	63		
	Pearson	−0.042	0.171	1	
(3) Socially minded	Spearman	0.049	0.211	1	
	N	57	35	57	
	Pearson	0.526***	0.096	0.033	1
(4) Humanitarian	Spearman	0.648***	0.112	0.004	1
	N	89	54	57	89

Source: Authors.
Data: Helliwell et al. (2019), Falk et al. (2018), WVS (2015), and EVS (2015).
Notes: See main text for the definition of the variables. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively.

Following Helliwell et al.'s (2017) proposals, **social trust and good governance** can be measured using IVS data by means of an index of *collective social capital* comprising three measures: first, the proportion of individuals that believe that most people can be trusted. Second, the average reported confidence in the police on a 4-point scale that ranges from 0 ("none at all") to 3 ("great deal of confidence"). And third, the average reported confidence in the parliament, measured on the same scale than the confidence in the police.

Actually, Helliwell et al. (2017) use as a proxy for social trust and good governance a measure of the absence of corruption: *perception of corruption* (the average of binary answers to two GWP questions: "Is corruption widespread throughout the government or not?" and "Is corruption widespread within businesses or not"), which, according to the authors, may arguably miss some important information. Importantly, they point out that, regarding happiness, good governance concerns more the actual performance of public institutions, such as a country's parliament, courts, or electoral systems, than their formal structure. The actual performance is referred to as the *quality of delivery* and it is measured as the average of four World Bank measures of governmental quality (Kaufman et al., 2009): government effectiveness, regulatory quality, rule of law, and the control of corruption. The formal aspect is referred to as the *quality of democracy* and is measured as the average of the remaining two World Bank measures: voice and accountability, and political stability and absence of violence. Finally, Helliwell et al. (2019) also use as an alternative indicator of governmental quality a GWP's measure of *confidence in government*.

Table 3.5 shows that the index of collective social capital is significantly correlated with all the other proxies for social trust and good governance. The association is particularly strong with the two GWP's variables: *perception of corruption* and *confidence in government*. The index of collective social capital has the appealing of including a measure of social trust and moreover is available for some more countries than the GWP's variables, thus we focus on this measure for the analysis.

Table 3.6 shows the six variables considered in our analysis, the indicators and the methods of construction. We have complete data for 103 countries that comprise –according to the United Nations, Department of Economic and Social Affairs, Population Division (2017)– 89% of the world population and cover most geographical and cultural regions.[10] Table B.1 in Appendix B shows the complete data set and

[10]See footnote 7 of Chapter 2 for further details. As compared with the previous chapter we lack data for North Cyprus, therefore Cyprus does not comprise this entity in the current analysis. We also lack data for Puerto Rico. On the other hand, in the current analysis the sample includes Taiwan, and Palestine.

Table 3.5: Indicators of social trust and good governance: Correlation matrix

		(1)	(2)	(3)	(4)	(5)
(1) Collective social capital	Pearson	1				
	Spearman	1				
	N	104				
(2) Perception corruption	Pearson	−0.595***	1			
	Spearman	−0.550***	1			
	N	99	101			
(3) Democratic quality	Pearson	0.160	-0.356***	1		
	Spearman	0.233**	-0.291***	1		
	N	104	101	106		
(4) Delivery quality	Pearson	0.347***	−0.580***	0.861***	1	
	Spearman	0.385***	−0.439***	0.851***	1	
	N	104	101	106	106	
(5) Confidence government	Pearson	0.625***	-0.587***	−0.093	0.067	1
	Spearman	0.610***	-0.589***	−0.070	0.044	1
	N	95	94	96	96	96

Source: Authors.
Data: WVS (2015), EVS (2015), and Helliwell et al. (2019).
Notes: See main text for the definition of the variables. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively.

Table B.2 shows the descriptive statistics of the six variables.

Table 3.7 shows that there are not problematic correlations between pairs of variables.[11] Interestingly, the proxies for the strength of family ties and individual freedom (*family ties* and *tolerance of out-groups*) are strongly correlated with *social support*, although the signs of such associations are at odds with the theoretical discussion presented in Section 3.2.

3.3.2 Clustering method

In this chapter we carry out a cluster analysis to classify countries according to their similarities and dissimilarities across six social context indicators. It must be noted that this number of clustering variables (given the sample size) is consistent with the Formann's (1984) rule. All computations are performed with R version 3.6.1 (R Core Team, 2018), using the packages *BBmisc* (Bischl et al., 2017) for data standardization and *factoextra* for cluster analysis (Kassambara & Mundt, 2019).

In particular, we conduct a hierarchical cluster analysis relying on the Ward's

[11] See footnote 13 of Chapter 2.

Table 3.6: Classification variables

Social context dimensions	Variables	Indicators	Sources	Methods of construction
I. Social support and sociality	I.1. Social support	I.1.1. Proportion of individuals having someone to count on	Helliwell et al. (2019) (Gallup World Poll)	Average by country
	I.2. Family ties	I.2.1 Average importance attributed to the family I.2.2. Proportion that believe love and respect is owed to parents always I.2.3. Proportion supporting maximum responsibility towards one's children I.2.4. Average attachment to the goal: make parents proud	WVS (2015) and EVS (2015)	We construct two measures: 1) *family ties (AG)* = I.2.1 + I.2.2 + I.2.3 2) *make parents proud+* = I.2.1 + I.2.4 (weighted averages by country). Then we z-standardize 1) and 2) and compute their mean.
	I.3. Friendship ties	I.3.1. Average importance attributed to friends	WVS (2015) and EVS (2015)	Weighted average by country
II. Individual freedom	II.1. Tolerance of out-groups	II.1.1. Proportion not reporting intolerance towards homosexuality	WVS (2015) and EVS (2015)	Weighted average by country
III. Altruism	III.1. Generosity	III.1.1. Proportion of donors to charities[a]	Helliwell et al. (2019) (Gallup World Poll)	Average by country
IV. Social trust and good governance	IV.1. Collective social capital	IV.1.1. Proportion that believe most people can be trusted IV.1.2. Average confidence in the police IV.1.3. Average confidence in parliament	WVS (2015) and EVS (2015)	Sum of the three indicators (weighted averages by country)

[a] Controlling for income effect.
Source: Compiled by the Authors.
Notes: Refer to the main text for further information.

Table 3.7: Classification variables: Correlation matrix

		(1)	(2)	(3)	(4)	(5)	(6)
(1) Social support	Pearson	1					
	Spearm.	1					
	N	103					
(2) Family ties	Pearson	-0.478***	1				
	Spearm.	-0.550***	1				
	N	103	103				
(3) Friendship ties	Pearson	0.103	-0.024	1			
	Spearm.	0.178*	-0.036	1			
	N	103	103	103			
(4) Tolerance of out-groups	Pearson	0.526***	-0.522***	0.014	1		
	Spearm.	0.634***	-0.546***	0.018	1		
	N	103	103	103	103		
(5) Generosity	Pearson	0.292***	-0.132	0.259***	0.522***	1	
	Spearm.	0.334***	-0.096	0.281***	0.501***	1	
	N	103	103	103	103	103	
(6) Collective social capital	Pearson	0.209**	-0.122	0.259***	0.157	0.399***	1
	Spearm.	0.274***	-0.145	0.279***	0.187*	0.481***	1
	N	103	103	103	103	103	103

Source: Authors.
Data: Helliwell et al. (2019), WVS (2015), and EVS (2015).
Notes: See Table 3.6 for the definitions of the variables.

method,[12] computing the squared Euclidean distances between countries,[13] and using the simple z-standardization method to correct differences in scale between variables –thus giving them equal weighting in the overall distance calculation.

The decision on the number of clusters to retain from the data is based on three different tools: the dendrogram, the agglomeration schedule, and the variance ratio criterion.[14] The dendogram suggests that four major clusters arise from the data.[15] The scree plot based on the coefficients of the agglomeration schedule is displayed in Figure 3.1 and points in the same direction.[16] Thus, it shows a distinct break due

[12]See Section 2.3.3 for a discussion of the different hierarchical clustering procedures. Using z-standardized data and the Euclidean distance metric, the average linkage method results, as expected, in a higher cophenetic correlation (0.714) than the complete and Ward's linkage methods (0.586 both of them). However, the average linkage method results in very unbalanced clusters that perform poorly in terms of the variance ratio and the silhouette width. According to these two measures the Ward's method performs much better than the complete linkage method. Results are available upon request.

[13]Based on the variance ratio, silhouette width, and Dunn index, the traditional Ward's method is preferred to its least absolute error version (Strauss & von Maltitz, 2017) for clustering solutions that involve four or more clusters. Results are available upon request.

[14]See Section 2.3.3 for an explanation of these tools.

[15]See the dendrogram plot in Figure B.1 in Appendix B.

[16]The agglomeration schedule is shown in Table B.3 in Appendix B.

to the increase in distance when switching from a four to a three-cluster solution. Finally, the w values associated with the variance ratios point also to a four-cluster solution.[17] In light of these results, the best number of clusters is arguably four.

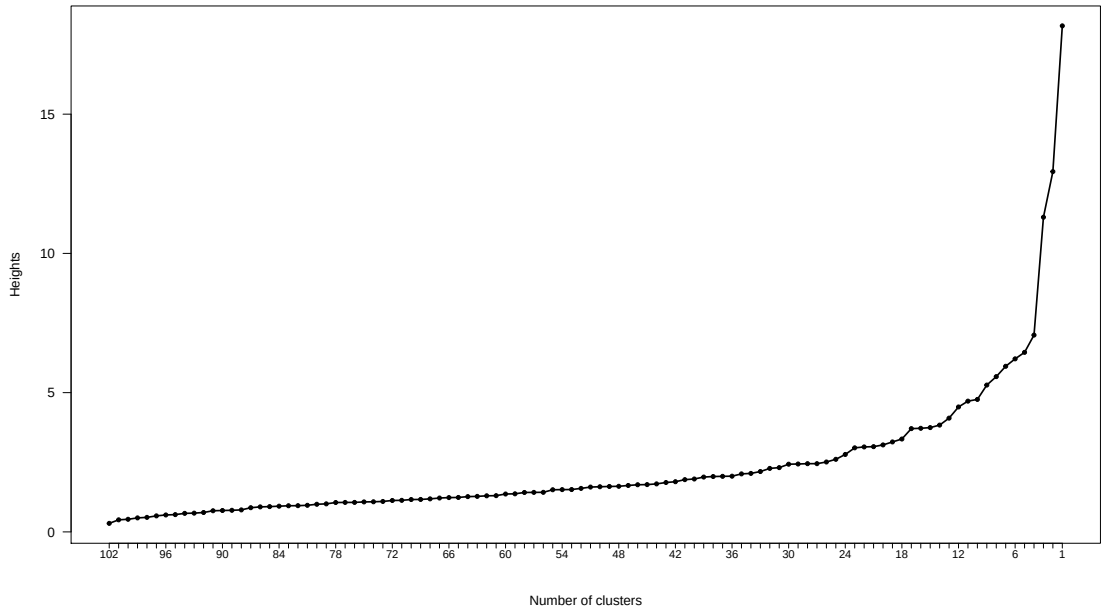

Figure 3.1: Scree plot: distances against the number of clusters

A one-way ANOVA analysis allows to formally distinguishing which variables are more influential in discriminating between these four groups of countries. According to this analysis all classification variables play a relevant role in the partition (see Table B.5 in Appendix B). The variable with the greatest discriminating power is *tolerance of out-groups*, followed by *generosity*. By contrast, the variable with the lowest relative importance in the classification is *friendship ties*.

3.4 Results

3.4.1 Main features of the social context country clusters

As noted above, the exercise produces four clusters.[18] Figure 3.2 shows the dendogram with the "optimal" one-level partition distinguished by colour. The first cluster (*C1*) includes 20 countries; the second one (*C2*) is composed of 31 countries; the third cluster (*C3*) includes 32 countries; and the fourth one (*C4*) is composed of 20 countries.

[17] See results in Table B.4 in Appendix B.

[18] Table B.6 in Appendix B shows the complete set of countries classified by cluster.

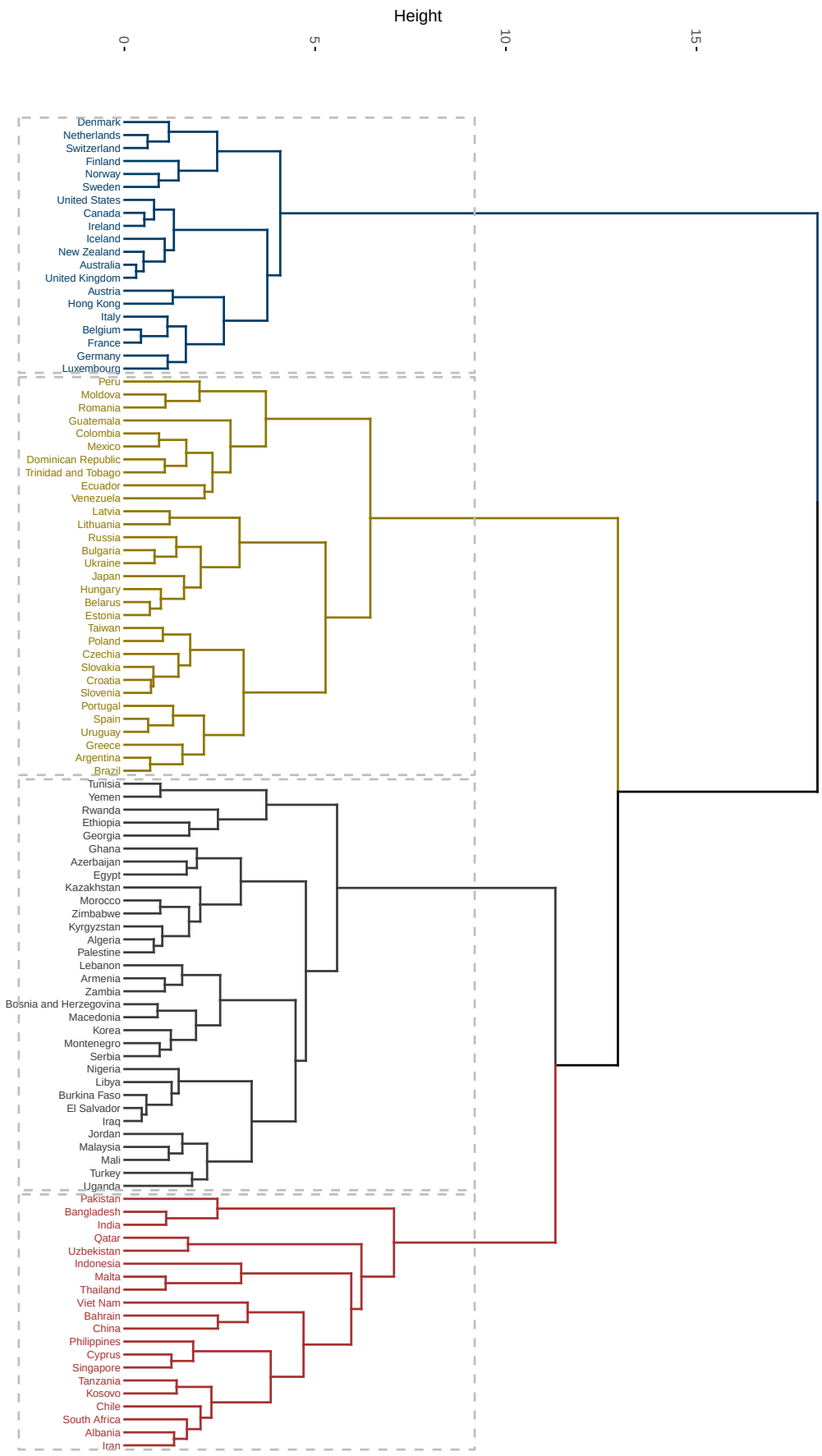

Figure 3.2: Dendogram: Four-cluster solution

Geographically, there is a clear pattern in the distribution of the country clusters. Thus, as shown in Figure 3.3, there is a concentration of countries in *C1* in Western Europe and the Anglosphere. Example members are Germany, Australia, and the United States. Regarding *C2*, there is a concentration of countries in Eastern Europe and Ibero-America. Example members are Portugal, Poland, Russia, and Argentina, although it also includes Japan. *C3* concentrates in Africa, the Middle East, Caucasus, and Central Asia, and also includes several countries from the Balkans. Example members are Bosnia and Herzegovina, Azerbaijan, Kazakhstan, Morocco, Turkey, and Zambia, although it also includes Malaysia and Korea. Finally, there is a concentration of countries in *C4* in South and Southeast Asia. Example members are India, Thailand, and China, although it also includes Uzbekistan, Chile and South Africa.

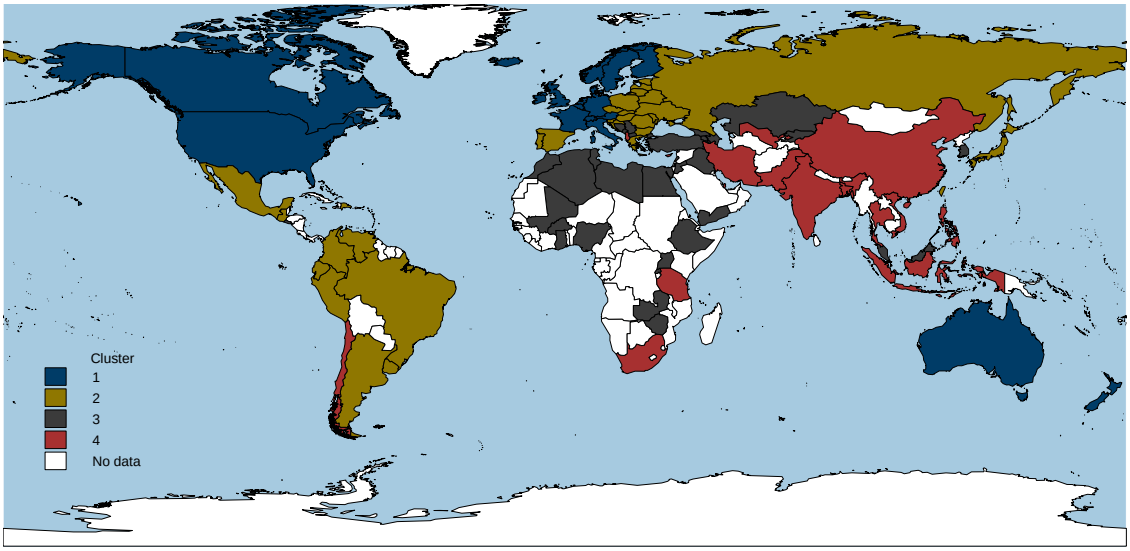

Figure 3.3: Geographic distribution of the social context country clusters

Regarding the characteristics of the four clusters obtained in the analysis, Table 3.8 shows the average values of the clustering variables by cluster (centroids) and their standard deviations. Figure 3.4 shows the relative values of the variables across clusters in terms of their maximum and minimum values.

Cluster 1 consists of countries with the strongest social foundations, but for the case of family ties. Thus, these countries rank first as a group in social support, friendship ties, tolerance of out-groups, generosity, and, along with those in *C4*, collective social capital. On the other hand, countries in *C1* present on average the weakest family ties. Importantly, the standard deviations of the different variables across clusters (and the dendogram displayed in Figure 3.2) suggest that *C1* is the most compact cluster.

Table 3.8: Means (Std. dev.) for classification variables by country clusters

Variable	C1	C2	C3	C4
Social support	0.942	0.88	0.762	0.807
	(0.031)	(0.047)	(0.084)	(0.119)
Family ties	-1.08	-0.275	0.747	0.528
	(0.666)	(0.857)	(0.572)	(0.778)
Friendship ties	2.479	2.182	2.417	2.172
	(0.101)	(0.151)	(0.164)	(0.22)
Tolerance of out-groups	0.805	0.533	0.25	0.523
	(0.089)	(0.173)	(0.101)	(0.181)
Generosity	0.198	-0.118	-0.093	0.074
	(0.11)	(0.097)	(0.097)	(0.165)
Collective social capital	3.769	2.568	3.045	3.905
	(0.347)	(0.399)	(0.543)	(0.786)

Source: Authors.
Data: Helliwell et al. (2019), WVS (2015), and EVS (2015).
Notes: See Table 3.6 for the definitions of the variables.

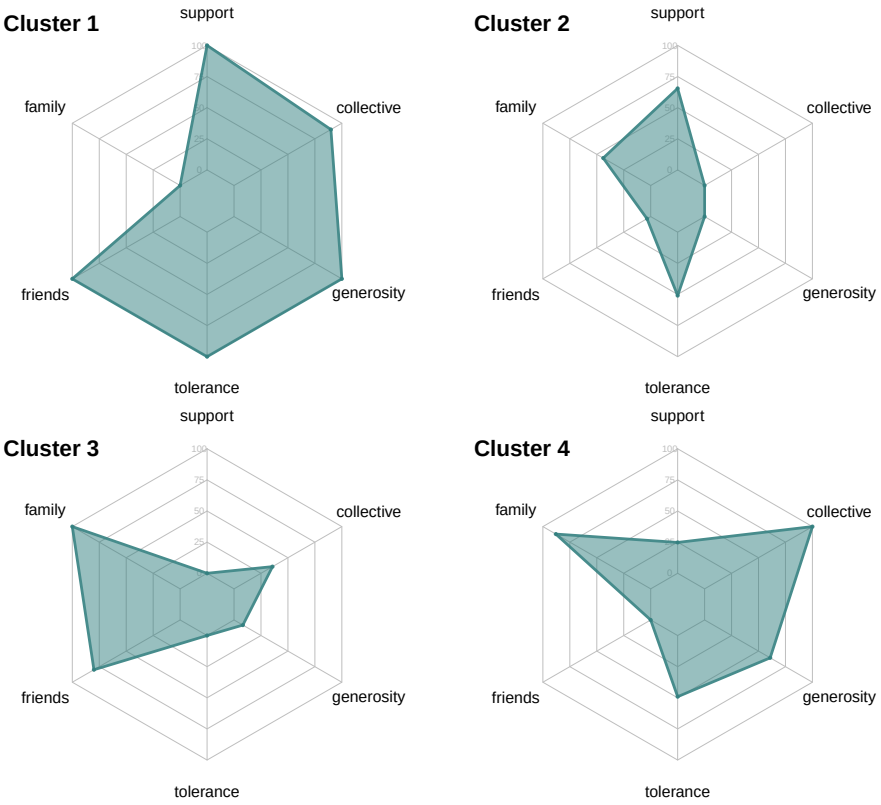

Figure 3.4: Variables' relative values across clusters

Cluster 2 is characterized by its combination of moderately high levels of social support, family ties, and tolerance of out-groups. On the other hand, *C2* presents the lowest levels of friendship ties (along with *C4*), generosity (along with *C3*), and collective social capital.

Cluster 3 presents very strong family and friendship ties, although, surprisingly, it ranks last in social support. It also presents the lowest tolerance of out-groups, and, along with *C2*, also the lowest level of generosity. The average level of collective social capital is also rather low in this cluster.

Finally, countries in Cluster 4 stand out for their very strong family ties and high levels of collective social capital. Moreover, they present moderately high levels of generosity and tolerance of out-groups. On the other hand, they show rather low levels of social support and, along with *C2*, the weakest friendship ties.

3.4.2 Robustness checks

In this section we check whether the previous classification is stable in the sense that using alternative clustering methods produces similar results.[19] In particular we compare the previous clustering with those resulting from two alternative methods: k-means and k-medoids, setting four as the number of clusters to be retained from the data.[20]

Before comparing the country clusters resulting from the different methods we compare their performance according to three internal measures of cluster validity: the variance ratio criterion, silhouette coefficient and Dunn index. These measures assess the two aspects that characterize a good clustering: compactness and separation.[21] Table 3.9 displays the results. It can be seen that the three methods perform similarly in terms of the internal measures of cluster validity.

Table 3.9: Comparison of internal validity measures of different clustering methods

	Variance ratio	Silhouette width	Dunn index
Hierarchical	34.457	0.262	0.16
K-means	34.605	0.255	0.171
K-medoids	34.214	0.261	0.14

Source: Authors.

[19]Note firstly that the classification is not affected by the order of the data set. The main findings also remain unchanged when we limit the sample to those countries for which we have data on *family ties (AG)* (Alessina & Giuliano, 2010).

[20]See 2.4.3 for a discussion of the K-means and K-medoids clustering procedures.

[21]See 2.4.3 for a discussion of these measures.

Regarding the stability of the clustering, 14 countries change clusters when we use K-means as clustering technique and 12 when we use the K-medoids method. Only three countries are grouped equally by both the K-means and PAM algorithms against the criterion of the Ward's method (Serbia, which is included in *C2* instead of *C3*; and Malta and Thailand, which are included in *C1* instead of *C4*). Summing up, 22% of the countries change their cluster allocation depending on the clustering method. This is not a negligible figure and therefore we should be cautious regarding the interpretation of the results.

Table 3.10 shows the countries that are grouped together under the three different clustering methods. The most notable aspect concerns the fact that all the countries that were included in *C1* and *C2* using the Ward's method are also grouped together using either the K-means or K-medoids procedures (note, however, that these methods result in an inflow of countries to those clusters, especially to *C2*). The divergences concern the remaining two clusters: *C3* and *C4*, in which, consequently, there are less non-changing countries. This is especially the case regarding *C4*, where only around one third of the countries are grouped together under the three different clustering methods. Interestingly, among the few countries that are consistently located in *C4*, more than half are from East and Southeast Asia.[22]

We have seen that around 20% of the countries change their cluster allocation depending on the clustering method. This result suggests that the data set, although clusterable, lacks a very strong tendency. In line with this conclusion, the Hopkins statistic takes a value around 0.35, which is significantly below the threshold 0.5 associated with randomly distributed data, but also suggests that the data set is only moderately clusterable.

Lack of strong tendency in the data set might make a blur of the more salient characteristics of the different country clusters. In this regard, the appealing of the K-medoids family of procedures is that they use exemplars (medoids) as cluster centers instead of means –thus they are less sensitive to noise and outliers. Table 3.11 shows the medoids of the different clusters and Figure 5 represents them relatively to the maximum and minimum values of the different variables.

Comparing Figures 3.4 and 3.5 we can see that the profile of the different clusters is essentially the same. The only noteworthy change is that Bulgaria (*C2*'s exemplar) shows less social support, weaker family ties and stronger friendship ties than the *C2*'s average country.

The K-medoids method is also affected by noise and outliers because it is con-

[22]Table B.7 shows those countries that may be considered at the boundary of the clusters and how are they clustered by the different clustering methods.

Table 3.10: Countries that do not change their cluster allocation

C1	C2	C3	C4
Australia	Argentina	Azerbaijan	China
Austria	Brazil	Armenia	Iran
Belgium	Bulgaria	Bosnia and Herzegovina	Philippines
Canada	Belarus	El Salvador	Singapore
Denmark	Taiwan	Ethiopia	Viet Nam
Finland	Colombia	Georgia	Tanzania
France	Croatia	Palestine	Kosovo
Germany	Czechia	Iraq	
Hong Kong	Dominican Republic	Kyrgyzstan	
Iceland	Ecuador	Libya	
Ireland	Estonia	Mali	
Italy	Greece	Montenegro	
Luxembourg	Guatemala	Morocco	
Netherlands	Hungary	Nigeria	
New Zealand	Japan	Rwanda	
Norway	Latvia	Zimbabwe	
Sweden	Lithuania	Tunisia	
Switzerland	Mexico	Turkey	
United Kingdom	Moldova	Macedonia	
United States	Peru	Egypt	
	Poland	Burkina Faso	
	Portugal	Yemen	
	Romania	Zambia	
	Russia		
	Slovakia		
	Slovenia		
	Spain		
	Trinidad and Tobago		
	Ukraine		
	Uruguay		
	Venezuela		

Source: Authors.

strained to perform a complete clustering. Alternatively, we can disregard this constraint and focus on those countries that arguably constitute more robust clusters. Thus, we focus on those countries that belong to the intersection of the Ward, K-means, and PAM clusterings (Table 3.10). Table 3.12 shows the average values of the different variables across such (intersected) clusters and Figure 3.6 represent them in relative terms.

Comparing Figures 3.4 and 3.6 we can see that the characterization of the differ-

Table 3.11: Medoids of the different clusters

	C1 – New Zealand	C2 – Bulgaria	C3 – Burkina Faso	C4 – Iran
Social Support	0.957	0.832	0.771	0.742
Family ties	-0.89	-0.509	1.267	0.218
Friendship ties	2.524	2.244	2.46	2.075
Tolerance out-groups	0.814	0.467	0.194	0.511
Generosity	0.282	-0.14	-0.052	0.025
Collective social capital	3.653	2.659	2.902	3.686

Source: Authors.

Figure 3.5: Medoids' relative values

ent country clusters does not change. There is only a slight decrease in the relative average strength of family ties and generosity, and a slight increase in the relative average level of social support in *C4'*. On the other hand, the increase in the absolute average level of collective social capital in *C4'* is associated with a slight decrease in the relative levels of collective social capital in *C3'* and especially *C1'*.

Table 3.12: Means (Std. dev.) for classification variables by country intersected clusters

	C1'	C2'	C3'	C4'
Social support	0.942	0.88	0.744	0.825
	(0.031)	(0.047)	(0.083)	(0.06)
Family ties	-1.08	-0.275	0.874	0.387
	(0.666)	(0.857)	(0.491)	(0.746)
Friendship ties	2.479	2.182	2.43	2.152
	(0.101)	(0.151)	(0.17)	(0.136)
Tolerance of out-groups	0.805	0.533	0.231	0.505
	(0.089)	(0.173)	(0.1)	(0.175)
Generosity	0.198	-0.118	-0.099	0.018
	(0.11)	(0.097)	(0.091)	(0.089)
Collective social capital	3.769	2.568	2.947	4.274
	(0.347)	(0.399)	(0.49)	(0.764)

Source: Authors.

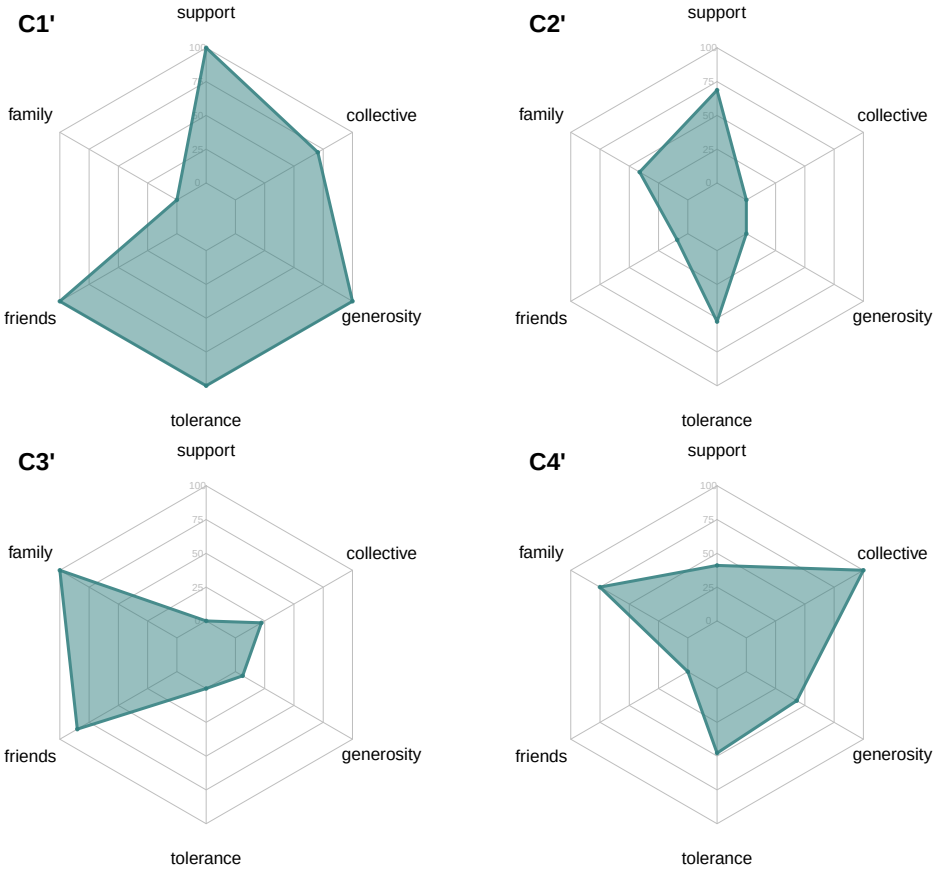

Figure 3.6: Variables' relative values across intersected clusters

Comparing the ANOVA results associated with the Ward's and the intersected clusterings (Tables B.5 and B.8 respectively) we can see that the most noteworthy change is that generosity, collective social capital, and especially social support have a more important role in discriminating among clusters in the latter.

3.5 Discussion of the country typology

In this section we discuss in more detail the main characteristics of the resulting country clusters. First we show that there are four interrelated data patterns underlying the clustering and rely on three of them to establish a more parsimonious typology of countries. Then we study how the clustering results relate to a Principal Component Analysis of the data. We show that the more parsimonious characterization of the clusters can be graphically displayed by means of the first two varimax rotated principal components. Finally we show some basic descriptive statistics of three selected subjective well-being indicators by country cluster.

First, Figure 3.4 shows that collective social capital goes hand in hand with generosity in the classification; thus, *C1* and *C4* show high relative levels in both dimensions, whereas the opposite is the case in *C2* and *C3*. This result is consistent with Falk et al. (2018) findings regarding the link between social trust and altruism (see Section 3.1). The index of collective social capital assesses the overall level of trust in the community or the larger society; and generosity measures the prevalence of a particular kind of prosocial behaviour. We may think that together both variables gauge the level of social cohesion.

Second, there is a strong negative correlation between family ties and social support: we can see that the stronger the family ties in a cluster the lower its level of social support. This relationship is rather puzzling and deserves further analysis, although previous psychological research has documented this kind of associations and has provided some explanations. Thus, in line with our result, Kim et al. (2008) review several studies that show that Asians and Asian Americans, whose culture is associated with stronger social ties, are more reluctant to explicitly ask for support from close others than are European Americans –what is consistent with the fact that they evaluate worse the act of seeking support after a stressful experience– and have more reduced expectations of the helpfulness of close others. More generally, it has been found that, on average, workers from less individualistic countries –in which there are stronger social ties– perceive less supervisor emotional support than workers from more individualistic societies (Glazer, 2006).

It is argued that in less individualistic societies, where maintaining traditional

order, modesty, and fulfilling role expectations are emphasized, individual-focused behaviours are seen inappropriate (Glazer, 2006). Moreover, Ogihara and Uchida (2014) point out that certain interpersonal skills, such as seeking new interpersonal relationships, explicitly seeking social support, or maintaining a high relational mobility by choosing desirable persons with whom to interact, allow people in more individualistic societies to enjoy interpersonal relationships while maintaining their independence.[23] On this basis, we focus on social support, which is a key component of the social foundations of happiness.

Third, tolerance of out-groups, our proxy for individual freedom, displays a clear pattern in conjunction with the previous two broad dimensions: social cohesion and social support. Thus, we can see that tolerance of out-groups is high when both social support and social cohesion are high (*C1*). Analogously, it is low when both social support and social cohesion are low (*C3*). Finally, there is an intermediate level of social tolerance when either social support is (moderately) high (*C2*) or social cohesion is high (*C4*). The positive association between social tolerance and social support is consistent with the previous arguments on the relationship between weak social ties and social support. In this regard, the negative correlation between family ties and social tolerance (individual freedom) was expected on the basis of Alesina and Giuliano (2010), who found a negative association between family ties and a measure of gender equality (individual freedom). Otherwise, the positive association between social cohesion and social tolerance seems reasonable but is not obvious. Previous literature has focused so far on the impact of individual freedom (mostly from an economic point of view) on social trust (Berggren & Jordahl, 2006), but *C4*'s combination of strong family ties and moderately high levels of social tolerance deserves further research.

Finally, the strength of friendship ties clearly discriminates between *C1* and *C3*, on the one hand, and *C2* and *C4*, on the other. Friendship ties are a source of social support and sociality that, in contrast to family ties, are thought to be associated with a more cohesive community life (Pugno & Verme, 2012). This interpretation is consistent with *C1* and *C2* characterizations. Thus, *C1* presents the strongest friendship ties along with the highest levels of collective social capital and generosity. On the other hand, *C2* presents the lowest levels of collective social capital and generosity along with very weak friendship ties. However, such interpretation is at

[23]Importantly, Kim et al. (2008) point out that Asians and Asian Americans are more likely to use and benefit from forms of support that do not involve explicit disclosure of personal stressful events and feelings of distress. This suggests that the question on social support may partly reflect a cultural trait: individualism, and not the actual experience of social support. This point deserves further research, although the measure of social support is interesting in its own right insofar it gauges certain beneficial interpersonal capacities.

odds with *C3* and *C4* characterizations. Thus, *C3* presents very strong friendship ties, but low relative levels of collective social capital and generosity, whereas *C4* shows the weakest friendship ties along with the highest level of collective social capital and a moderately high level of generosity.

Similarly, the pattern linking the level of social tolerance and the strength of friendship ties is not obvious. Thus, the latter is higher at both extremes of the social tolerance scale. In particular, *C1* and *C3*, which show the strongest friendship ties, present respectively the highest and the lowest levels of social tolerance. On the other hand, *C2* and *C4* are both intermediate in terms of social tolerance and are at the bottom of the ranking on friendship ties.

For the sake of simplicity we focus on the first three features –concerning the levels of social support, individudal freedom, and social cohesion– to characterize the country clusters. Thus, the resulting clustering suggests the existence of four types of countries or societies: 1) societies with high social support, high freedom, and high social cohesion; 2) societies with high social support, moderate freedom, and low social cohesion; 3) societies with low social support, low freedom, and low social cohesion; and 4) societies with low social support, moderate freedom, and high social cohesion.

The previous characterization of the clusters is consistent with the result of the varimax rotation of the first three principal components of the data set.[24] In particular, the more parsimonious characterization just discussed can be visualized by means of the first two varimax rotated principal components. Thus, Figure 3.7 shows the biplot of the first two rotated components. The length and angles of the arrows inform about the contribution of the different variables to each component.

The first rotated component is mostly linked to the strength of family ties in contrast to the level of social support. Hence, this component reflects the dimension of social support identified above. Basically, the more to the right a country is located, the more supportive is its society. The second rotated component appears as the dimension of social cohesion, as it is mostly linked to the levels of collective social capital and generosity. The higher a country is located in the plot, the higher its social cohesion. The arrow of the variable *tolerance of out-groups* forms an angle of roughly 45 degrees through the origin, thus contributing to the first two rotated components. The more to the top and the right (north-east) a country is located, the higher the level of individual freedom in the country, as measured by *tolerance*

[24]The first three principal components account for 75.54% of the variation of the dataset. Only the first two principal components have an eigenvalue larger than 1 (they account for 62.37% of the variation). We use R's packages *PCAmixdata* (Chavent et al., 2017) to perform the PCA and *tidyverse* (Wickham, 2017) and *ggrepel* (Slowikowski et al., 2019) to plot the associated results.

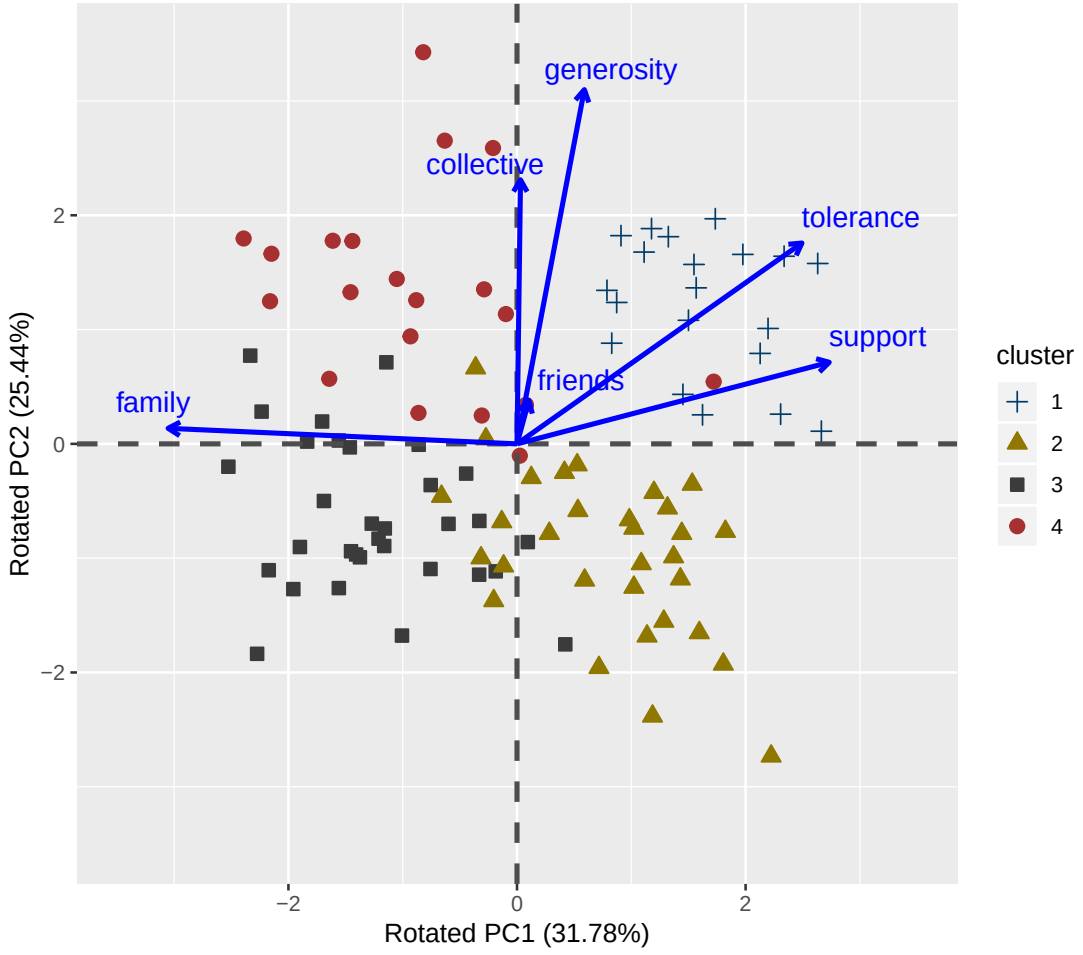

Figure 3.7: Biplot of the first two rotated components of the data

of out-groups. The variable friendship ties presents very low loadings in the first two rotated components and is clearly the main contributor to the third rotated component.

As can be seen, the distribution of the countries across the four quadrants formed by the axes is tightly related to the resulting clustering.[25]

Finally, although it is not a central goal of this research to link the clustering to external outcomes, it seems interesting to carry out a preliminary analysis of the distribution of subjective well-being across clusters given that the clustering variables proxy for the social foundations of happiness. Table 3.13 shows the average and the standard deviation of selected subjective well-being indicators by country cluster (using countries as units of analysis). Cluster 1 (*C1*, countries with strong social foundations) shows as expected the highest scores in all the three indicators:

[25]Figure B.2 in the appendix shows the labels of the different points.

highest average life satisfaction, highest proportion of very happy individuals, and the smallest proportion of either not very happy or not at all happy individuals. *C2* and *C4* show the same average life satisfaction level. Regarding happiness, which seemingly relies more on affective well-being, *C4* performs better as a group with a higher proportion of very happy people and a smaller proportion of either not very happy or not at all happy individuals. *C3* is the group that shows the lowest average life satisfaction. Regarding happiness, it performs similarly to (maybe slightly better than) *C2* in terms of the proportion of very happy people and the proportion of either not very happy or not at all happy individuals, maybe due to the fact that family and friendship ties are stronger in *C3*.

Table 3.13: Means (Std. dev.) for subjective well-being indicators by country clusters

	C1	C2	C3	C4
Average life satisfaction	7.635	6.663	6.058	6.712
	(0.416)	(0.891)	(0.709)	(0.962)
Proportion very happy	0.341	0.233	0.256	0.324
	(0.094)	(0.161)	(0.127)	(0.143)
Proportion unhappy	0.078	0.240	0.213	0.158
(either not very happy or not at all happy)	(0.038)	(0.112)	(0.092)	(0.106)

Source: Authors.
Notes: Life satisfaction is measured in the IVS by means of the question: "All things considered, how satisfied are you with your life as a whole these days? Using this card on which 1 means you are 'completely dissatisfied' and 10 means you are 'completely satisfied' where would you put your satisfaction with your life as a whole?" Happiness is measured by means of the question: "Taking all things together, would you say you are: very happy, quite happy, not very happy, or not at all happy?"

3.6 Conclusions

The social environment has been estimated to account for around half of the explained variation in mean life evaluations across countries. We can distinguish four major social aspects: social support and sociality, individual freedom, altruism, and trust and good governance. These four aspects are theoretically distinct and have been shown to exert independent effects on life evaluations. Moreover, previous research suggests that there are complex interrelations among them. In this paper we have tried to identify patterns in the joint distribution of some selected indicators of the social environment across countries.

First we have carried out a thoroughly discussion of the concept of social foundations of happiness and empirically study several alternative indicators for each of

the four major aspects considered. On this basis, we have selected six indicators trying to fully describe the social environment of countries: the levels of social support, family ties, friendship ties, tolerance of out-groups, generosity, and collective social capital. Then we have carried out a cluster analysis using such indicators as classification variables to group similar countries together and characterize them.

We have identified four country clusters linked to four distinct data patterns. The first data pattern concerns the strong positive correlation between the indicators of generosity and collective social capital, which together are thought to reflect the level of social cohesion in a country. The second data pattern concerns the strong negative correlation between the indicators of social support and family ties, which are simply interpreted as the ability to achieve social support. The third data pattern concerns the joint distribution of tolerance of outgroups, our proxy for individual freedom, and the previous two broad characteristics: social support and social cohesion. Finally, the fourth data pattern concerns the distribution of the strength of friendship ties across clusters.

Focusing on the first three features (actually the third one summarizes all the relevant patterns), which are more familiar in the literature, the resulting clustering suggests the existence of four archetypal societies: i) supportive, free, and cohesive societies –thus those with very strong social foundations; ii) supportive, moderately free, but non-cohesive societies; iii) non-supportive, non-free, and non-cohesive societies –thus those with very weak social foundations; and iv) non-supportive, but moderately free and cohesive societies.

Geographically, the group with the strongest social foundations consists basically of countries from Western Europe and the Anglosphere (UK, Ireland, US, Canada, Australia, and New Zealand). The countries showing moderately high levels of social support, an intermediate level of individual freedom, and low levels of social cohesion are concentrated in Ibero-America and Central and Eastern Europe. The countries characterized by showing low levels of social support, an intermediate level of individual freedom, and high levels of social cohesion are most of them from South and Southeast Asia. Finally, most of the countries with weak social foundations are from Africa, the Balkans, Middle East, Caucasus, and Central Asia.

The proposed typology constitutes a preliminary attempt to evaluate countries in terms of their social foundations. It relies on a comprehensive and well-established set of indicators of the social environment that allows producing a world classification that is conceptually sounding and informative. It is for instance noteworthy the way two well-known groups of countries –Latin America and Confucian countries– are classified.

Regarding Latin American countries, the resulting classification is somewhat at odds with the thesis that they constitute a distinguishable group characterized by showing strong social ties and high sociality (Beítya, 2016; Rojas, 2018). If these characteristics were actually so marked we would expect Latin American countries to emerge as a distinguishable cluster, which is not the case. Most of them (all but Chile and El Salvador) are clustered together, but they do not constitute even a distinguishable subcluster within such cluster.

Regarding Confucian countries, this group is considered a rather homogeneous group, especially considering their social environments; albeit there are growing concerns about recent changes in the social environment of countries such as Japan, where trust may be affected by increasing individualism (Ogihara & Uchida, 2014). In fact the resulting classification suggests that there are important differences among Confucian countries social environments. The classification of China, Viet Nam, and Singapore fits the standard characterization of Confucianism as a culture that enhances social cohesion at the expense private benefits such as social support. However, the classification suggests that the social environment of other Confucian countries may have changed significantly in recent decades. Thus, Hong Kong is included in the cluster of countries characterized by their strong social foundations, thus showing a more supportive and free, in addition to cohesive, environment. Japan and Taiwan are included in the cluster of countries characterized by their low levels of social cohesion, intermediate levels of freedom, and moderately high levels of social support. Finally, Korea is included in the cluster of countries characterized by their weak social foundations.

Obviously, it is possible that the selected indicators are not adequate, thus precluding us from finding the actual social context clusters. Although we have provided some reassuring evidence in this regard, showing for instance the positive correlation between objective and subjective measures concerning friendship relationships, future research on the social foundations of happiness may have to make an effort to improve the available data. Moreover, future investigations may have to search for a more fine-grained characterization of the social environment of countries, probably focusing on a smaller set of them for which more data is available.

It would be especially interesting to study the reason why family ties seem to be linked to social support at the individual level but not at the aggregate level, where its negative association with the ability to achive social support seems to prevail. Moreover, the moderately high relative levels of social tolerance in *C4*, which emerge in a context of strong family ties, deserves also further research using alternative proxies for individual freedom to explain this counter-intuitive relationship (in gen-

eral, as suggested by the literature, there is a strong negative correlation between traditional family ties and our proxy for individual freedom). Does this evidence indicate that our proxy for individual freedom performs poorly in most of the countries included in *C4* or there is a more interesting story behind our results? Importantly, the high levels of social cohesion may play a role in this issue. Otherwise, it would be interesting to study the role of friendship ties in different countries as we have observed a distinct pattern in this variable that we are unable to interpret yet.

Moreover, in this research we have focused on some characteristics of the social context well-established within the economics of happiness. We have not directly considered in our research the well-known individualism-collectivism cultural trait or other cultural values linked to how people view the self and the relations with others that may shed additional light on the social foundations of happiness. In this regard, future research may benefit from integrating different approaches.

Even more importantly, to further validate and motivate the classification we may have to link it with relevant external outcomes or characteristics. In this research we have carried out a preliminary analysis of the distribution of subjective well-being in the different country clusters. More work in this direction is necessary; and also checking whether the impact of different events, such an economic crisis, varies across groups.

It would be also interesting to analyse any possible dynamics in the social foundations of happiness along time. Thus, although the social environment is expected to be quite persistent it is susceptible of changes and it is important to monitor them. In this regard, cluster analysis can be carried out in different time periods to compare the groups found in each period and to analyse the dynamics of each country in comparative terms.

Chapter 4

Religiosity and life satisfaction across countries: New insights from the self-determination theory*

4.1 Introduction

Religions are a major social phenomenon: 84% of the world's population is estimated to identify with a religious group and this figure is expected to rise in the future (Pew Research Center 2017); but traditionally they have received little attention from social scientists, probably because the phenomenon is less prevalent within this particular group (Baumeister, 2002), and maybe because of the traditional secularization hypothesis, which establishes that the importance of religion declines as societies develop socio-economically and people become more educated. However, nowadays it is widely accepted that the classic version of secularization theory has several flaws and needs to be updated (Norris & Inglehart, 2004).[1] Re-

*This chapter also appeared as Domínguez and López-Noval (2020).

[1]Norris and Inglehart (2004) point out that the traditional secularization theory comprises two complementary theses. The first one concerns religious values and believes, and the second one the role of religion in sustaining social solidarity and cohesion. The former is mostly owed to Max Weber and basically asserts that the gradual spread of a rational view of the world based on empirical standards of proof, scientific knowledge of natural phenomena, and technological mastery of the universe may progressively undermine religious values and believes. The other thesis is mostly owed to Emile Durkheim and states that the increasing number of specialized professionals and organizations and the expansion of the welfare state may gradually substitute religions in the provision of healthcare, education, social control, and welfare safety nets. The problem is that these theses are at odds with the evidence that religions have not disappeared from the world, not even from the most socio-economically developed countries.

ligions seemingly play roles not easily substituted by non-religious alternatives. In this regard, happiness studies are well suited to contribute to the understanding of the religious phenomenon and its possible evolution.

In this paper we focus on the relationship between religiosity and life satisfaction at the cross-country level.[2] Recently, happiness studies have consistently found that within a given society religious people evaluate their lives higher than non-religious people, irrespective of their faith (Dolan et al., 2008).[3] However, in cross-country analyses no correlation is observed between average levels of religiosity and mean life evaluations.[4] Deaton and Stone (2013) refer to this contradictory finding as the "aggregate religion puzzle." It is especially puzzling taking into account that the aggregate level of religiosity has been found to produce positive spill overs for both religious and non-religious individuals (Clark & Lelkes, 2009). According to Deaton and Stone (2013), the fact that more religious places usually suffer from more social problems suggests that religion is often an imperfect substitute for income, health, personal security and effective public services. In this regard, religion has been found to function as an insurance that buffers against negative life events such as unemployment (Clark & Lelkes, 2006), and macroeconomic instabilities associated with large economic reforms (Popova, 2014). Graham and Crown (2014) point out that this insurance role may help to explain the aggregate religion puzzle –under the reasonable assumption of adverse selection (Sinding Bentzen, 2019). However, it does not solve the puzzle, as we expect to observe a significant positive correlation once accounting for this factor.

We try to shed new light on the aggregate religion puzzle based on the self-determination theory (Ryan & Deci, 2000). Firstly it must be noted that religions are part of the cultural heritage of countries. They prescribe rules of behaviour that determine people's beliefs and values (Campante & Yanagizawa-Drott, 2015; Falk et al., 2018). According to the self-determination theory a key aspect of any so-

[2]Reported life satisfaction is a commonly used measure of cognitive subjective well-being (Luhmann et al., 2012). Other usual measures are Cantril Ladder life evaluations and reported happiness with life overall (Helliwell et al., 2015). We are interested in cognitive subjective well-being in general; consequently in the literature review we may use the term life satisfaction, life evaluation, or overall happiness depending on the specific measure used by the different researchers. Moreover, following a standard practice we use the term *life evaluation* to refer to any cognitive evaluation of life overall, thus encompassing the three previously seen measures.

[3]Graham and Chattopadhyay (2009) do not find the usual positive association between religiosity and overall happiness in Afghanistan. They argue that in this country, contrary to what happens in other places, religion is a subject of extreme political and societal divisions. Otherwise, evidence shows that not being affiliated to the majority religious denomination in a country moderates the overall association between religiosity and life evaluations (Clark & Lelkes, 2009; Graham & Crown, 2014).

[4]Inglehart et al. (2008) find that the aggregate level of religiosity predicts future average (cognitive) subjective well-being. However their sample of countries is very limited.

cial institution is the extent to which individuals follow the associated prescriptions autonomously, as opposed to externally directed. In this regard, religiosity may respond to four different regulatory processes or motivations: (i) external rewards and punishments; (ii) feelings of guilt, fear or pride; (iii) conscious valuing of the religious prescriptions, that are owned as personally important; and (iv) complete assimilation of the religious prescriptions, which would have been evaluated and brought into congruence with one's other values and needs. Obviously, the prevalence of each kind of regulatory process is expected to be associated with different levels of well-being.

We posit the hypothesis that differences in the regulatory process underlying the observance of religion across countries may contribute to explain the aggregate religion puzzle. Our inquiry is in line with Hayward and Elliot (2014), who have found that the governmental regulation of religion, as measured by an index of political rights and civil liberties, moderates the association between religiosity and life satisfaction at the individual level. We focus on the cross-country level association, and, in addition to a general measure of freedom, we may include in our empirical model novel measures of social norms and beliefs about religion that may be similarly associated with other non-autonomous kinds of religiosity.

We use Helliwell and Wang (2013) six factors model as a benchmark to test whether religiosity enhances life satisfaction at the aggregate level conditional on certain social norms and beliefs. We would control for levels of GDP per capita, health, social support, collective social capital, and freedom, which along with levels of generosity have been found to explain around three-quarters of the variation in mean life evaluations across countries and years. We would use data from the World Values Survey and the European Values Study, merged in the Integrated Values Survey 1981-2014. GDP data would be drawn from the World Bank's World Development Indicators. Some robustness checks may use data on social support, perceived corruption and generosity from Helliwell et al. (2019), who use data from the Gallup World Poll. Regarding the religious phenomenon, we would work with two sets of variables. On the one hand, three usual measures encompassing both the social-institutional and the personal dimensions of religiosity (Helliwell, 2003); and, on the other hand, two variables proxying for the type of regulatory process underlying the observance of religion. It must be noted that as an unobservable characteristic such regulatory process may be driving previous literature results on the association between religiosity and life evaluations at the cross-country level. Although causality may not be claimed, we carry out a thoroughly discussion of the possible endogeneity issues affecting our results to support their reliability.

The eventual finding of a positive relationship between religiosity and life satisfaction would suggest that religiosity is not merely an imperfect substitute for other sources of well-being at the cross-country level. Such a result would be consistent with the evidence found at the individual level, thus reinforcing that evidence and its implications. Moreover the finding may contribute to the general knowledge of the religious phenomenon; in particular suggesting why some country-level data does not conform to the traditional secularization hypothesis (Deaton & Stone, 2013). In the next section we study the religious phenomenon and the mechanisms that are thought to operate in its relation with subjective well-being. The method used in the empirical analysis is discussed in section three. In section four we present the results, some robustness checks, and the discussion about possible endogeneity problems. The paper ends with the conclusions.

4.2 Religiosity and cognitive subjective well-being

Religiosity is the expression of religion by individuals. Religion is a system of beliefs, rites, organizational arrangements, ethical norms and sentiments towards divinity that is transmitted through socialization; whereas religiosity is the way people live their religion (Marzal, 2007). Religiosity has both a social-institutional and a personal dimension (Helliwell, 2003). The social-institutional dimension concerns the participation in social activities associated with organized religion. It is usually assessed as the frequency of attendance at religious services. The personal dimension concerns the religious beliefs and values, and the private religious practices. It is commonly assessed as the self-reported identification as a religious person, the importance attributed to religion or God, and the frequency of private prayer.

Regarding the possible links between religiosity and well-being, the personal dimension of religiosity is thought to provide individuals with cognitive resources consisting of a coherent system of beliefs (E. Diener & Seligman, 2004) that may confer a sense of meaning or purpose in life (E. Diener et al., 2011), thus reducing uncertainty about the self and providing a sense of control (Hayward & Elliott, 2014). Besides, it regulates conducts promoting health and well-being enhancing behaviours (McCullough & Willoughby, 2009; Deaton & Stone 2013) like reducing cigarette and alcohol consumption, increasing physical exercise, and encouraging medical compliance (Hayward & Elliott, 2014). The social-institutional dimension of religiosity is thought to facilitate social integration by enhancing strong family and friendship ties (E. Diener et al., 2011; Lim & Putnam, 2010) and giving access to formal social support networks that provide both material resources (Deaton &

Stone, 2013) and a positive social identity (Hayward & Elliott, 2014).

At the individual level, the positive association between religiosity and cognitive subjective well-being is in general well established (Dolan et al., 2008). Both religious social activities and personal beliefs have been found positively associated with individual life evaluations (Clark & Lelkes, 2006; Deaton & Stone, 2013). Moreover, Helliwell (2003), who controlled for both dimensions, found that both religious aspects have strong and easily distinguished links to life satisfaction. However, Graham and Crown (2014) find that only the social aspect of religiosity is significantly associated with life evaluations. The spiritual or purposeful aspect of religiosity does not hold for evaluative wellbeing. Moreover, Clark and Lelkes (2006) find that apart from its main effect religiosity has a stress-buffering effect against negative life events such as unemployment. This protective effect is interpreted as insurance.

Most of previous findings are correlational and thus may likely suffer from endogeneity problems. Firstly, there are unobserved individual characteristics, e.g. personality traits, that are likely to be correlated with both cognitive subjective well-being and religiosity. Popova (2014) points out that it is unclear who, whether pessimists or optimists, whether less sociable or more sociable individuals, are likely to become religious, and thus the direction of the bias is also ambiguous. Reverse causality is another likely source of endogeneity. For instance, Sinding Bentzen (2019) has recently shown that individuals become more religious as a response to earthquakes. On the other hand, Maselko et al. (2012) find that depression has a negative impact on attendance at religious services. Thus the direction of the bias is also ambiguous in this case. Popova (2014) addresses endogeneity using the historical religious propensity of different countries as an instrument and finds that the IV estimates of the insurance role of religiosity are greater than those obtained assuming exogeneity.

In the light of the evidence found at the individual level, we may expect more religious places to show higher levels of cognitive subjective well-being on average, especially taking into account Clark and Lelkes' (2009) finding that the aggregate level of religiosity in a region seems to enhance life satisfaction of both religious and non-religious individuals. However, evidence shows that aggregate levels of religiosity and mean life evaluations are uncorrelated (Deaton & Stone, 2013). Graham and Crown (2014) point out that the insurance role of religions may help to explain this seemingly aggregate religion puzzle. However, this partial explanation does not solve completely the puzzle. Thus, previous research that accounts for country-level circumstances that may confound the relationship between the average levels of religiosity and cognitive subjective well-being adjusts the estimated correlation, which

becomes zero instead of negative, but has failed to find the expected significant positive correlation (Deaton & Stone, 2013).

The self-determination theory (e.g., Ryan and Deci, 2000) may shed new light on the relationship between religiosity and cognitive subjective well-being at the country level. This psychological theory states that the impact of a given life domain on well-being depends crucially on the prevalent regulatory process or motivation underlying people's performance in that domain. Ryan and Deci (2000) distinguish four different regulatory processes. Thus, people may act (i) motivated by external rewards and punishments; (ii) trying to avoid feelings of guilt or anxiety or to attain ego enhancements such as pride; (iii) because the behaviours and values prescribed in that domain are accepted and owned as personally important; (iv) because the behaviours and values prescribed in that domain have been brought into congruence with one's other values and needs.

The prevalence of external rewards and punishments means that the behaviours and values prescribed in a given domain have not been internalized by individuals.[5] This regulatory style is known as *external regulation*. The prevalence of internal rewards (pride) and punishments (fear, guilt) means that the prescriptions have been only partially internalized, in the sense that they have not been fully accepted by individuals, whose actions ultimately respond to external causes. This form of regulation is known as *introjected regulation* or *introjection*. On the other hand, the prevalence of the conscious valuing of the behaviours and values prescribed means that they have been internalized and accepted by individuals, who identify with them. This regulatory style is known as *regulation through identification*. Finally, the sense of congruence between the behaviours and values prescribed and one's other values and needs means that they have been completely assimilated by the individual. This form of regulation is known as *integrated regulation*.

Under the first two forms of regulation (external and introjection) individuals do not act autonomously because their motivation rests on external causes, whereas under the last two forms of regulation (identification and integration) individuals do act autonomously. Autonomy is expected to enhance the well-being of individuals, whereas non-autonomous behaviours are expected to either leave individuals equal or diminish their well-being. Thus, under an external regulation individuals do not draw any direct utility from a life domain.[6] Regarding introjection, Ryan et al.

[5]Internalization refers "to the process through which an individual transforms a formerly externally prescribed regulation or value into an internal one" (Ryan et al., 1993, p. 586).

[6]In the light of the self-determination theory, the government restrictions on religious freedom examined by Hayward and Elliott (2014) may reflect the prevalence of an external form of regulation. The finding of a positive interaction between religious freedom and personal religiosity suggests that, as the self-determination theory predicts, the association between religiosity and life

(1993) point out that it is a regulation style characterized by the experiences of conflict and pressure, and thus it is associated with a number of negative psychological outcomes, including self-esteem vulnerabilities and anxiety. On the contrary, identification, which is the result of being attracted by compelling contents and meanings and hence is characterised by greater volition, "should conduce toward greater identity stability, self-esteem, and a relative absence of mental health difficulties" (Ryan et al., 1993, pp. 588-589).

Ryan et al. (1993) examine the effect of two kinds of religious internalization: identification and introjection, on religiosity (church attendance), on the one hand, and psychological well-being and mental health, on the other. The authors use a 12-item measure of religious internalization: the Christian Religious Internalization Scale, which includes items such as "Pray because I enjoy it" and "Turn to God because I enjoy spending time with Him" as identified items, and "Pray because God will disapprove if I don't" and "Attend church because others would disapprove if I didn't" as introjected ones. Measures of both religious identification and especially religious introjection were found to be positively associated with church attendance. Moreover, they found that identification correlates positively with several measures of psychological well-being and negatively with various mental health conditions, whereas introjection emerged as negatively associated with the psychological well-being measures and positively associated with the mental health conditions.

Ryan et al. (1993) carry out an individual-level analysis and, moreover, they do not study the relationship between religiosity and cognitive subjective well-being. However, the self-determination theory may arguably be applied to country-level data and to the relationship of interest. In fact, Ryan and Deci (2000) stress the idea that the regulation style is a key feature of social institutions that may likely vary across societies. In line with self-determination theory (Ryan & Deci, 2000) and Ryan et al.'s (1993) findings we predict that countries with a higher prevalence of either religious identification or religious introjection will show higher levels of religiosity. Moreover, because of the different impact of religious identification and religious introjection on well-being and mental health, we expect that the prevalent type of religious regulation may confound the relationship between religiosity and life satisfaction at the cross-country level.

In this regard, we predict that after accounting for the prevalent type of religious regulation a positive association between the average levels of religiosity and life satisfaction may arise. The eventual finding of this positive relationship would suggest

satisfaction is higher in those countries in which religious individuals are more autonomous. In fact, Hayward and Elliott's (2014) interpretation in terms of the self-categorization theory is very much in line with the interpretation suggested by the self-determination theory.

that religions are not merely imperfect substitutes for other sources of life satisfaction at the cross-country level, but they effectively exercise some other functions (cognitive, regulative, and/or integrative).

4.3 Method

4.3.1 Data

We use data from the Integrated Values Survey 1981-2014 (IVS), which merges data from the World Values Survey (WVS, 2015) and the European Values Study (EVS, 2015). Both have been collecting data along several rounds (six and four, respectively) since 1981 for nationally representative samples from more than one hundred countries around the world on a wide variety of factors affecting the distribution of mean life satisfaction across countries, ranging from health to collective social capital. A traditional caveat for this family of surveys was that low and middle income countries were under-represented, however in the last rounds this problem has being somehow mitigated. Data on GDP per capita is drawn from the World Bank's (2018) World Development Indicators. All indicators but GDP per capita are based on individual-level data. We aggregate data using the original country weight variable provided in the databank to obtain representative values for the whole population.

Regarding cognitive subjective well-being, the IVS asks about overall happiness and satisfaction with life as a whole. Responses to these questions have been repeatedly found highly correlated, although the happiness question has been shown to capture more ephemeral feelings (Helliwell et al., 2015). As we are interested in cognitive subjective well-being we focus on countries' life satisfaction levels, which are assess as the average response to the following question: "All things considered, how satisfied are you with your life as a whole these days? Using this card on which 1 means you are 'completely dissatisfied' and 10 means you are 'completely satisfied' where would you put your satisfaction with your life as a whole?" We would subsequently use the question on overall happiness as a robustness check.

Regarding religious phenomenon, the social-institutional aspect of religiosity is measured as the average frequency of attendance at religious services (*attend*). This measure is based on the question: "Apart from weddings, funerals and christenings, about how often do you attend religious services these days?" which response scale ranges from 1 ("more than once a week") to 7 ("never, practically never").[7] Fol-

[7]In the EVS and the second wave of the WVS this question includes eight response categories: "more than once a week," "once a week," "once a month," "Christmas/Easter day," "other specific

lowing Hayward and Elliott (2014) and similarly to Gruber (2005), we construct a six-point scale variable joining together response categories 6 ("less often") and 7 ("never, practically never") and reversing the order of the responses to facilitate their interpretation. On the other hand, we use two measures concerning the personal aspect of religiosity. The first one refers to the proportion of (self-identified) religious individuals in the country (*religious*), which is based on the question: "Independently of whether you attend religious services or not, would you say you are: (a) a religious person, (b) not a religious person, or (c) a convinced atheist." We first construct a binary variable to indicate whether the respondent is a religious person and then compute the country-wave means. The second measure refers to the average importance given to God in the country (*god*), which is computed as the average response to the question: "How important is God in your life?" which response scale ranges from one ("not at all important") to 10 ("very important").

Regarding possible proxies for religious introjection, we use two variables. On the one hand, the proportion of individuals that consider religious faith an important quality children should be encouraged to learn at home (*chfaith*) –we aim at measuring the extent to which parents inculcate religious faith into their children–.[8] On the other hand, we also use the proportion of individuals that believe in hell (*hell*). This variable has been previously used as a measure of the strength of religious beliefs in general by Barro and McCleary (2003). However, their own interpretation of such religious belief as an effective punishment mechanism suggests it may gauge the extent of religious introjection as opposed to religious identification. Finally, to examine the potential impact of the different religious variables on people's well-being and to discriminate among them we may use as an auxiliary dependent variable the proportion of individuals that get comfort and strength from religion (*blessed*).

Our empirical analysis would ideally control for the main determinants of the distribution of reported cognitive subjective well-being across countries: levels of income, social support, health, freedom, collective social capital, and generosity (Helliwell & Wang, 2013). We use the variable from the World Bank's World Development Indicators as a measure of the GPD per capita: "GDP per capita, PPP (constant 2011 international $)." It must be noted that the first year of the series is 1990, which corresponds with the second wave of the IVS. Following standard

holy days," "once a year," "less often," "never, practically never." In the rest of WVS rounds, categories "Christmas/Easter day" and "other specific holy days" are merged under the category "only on special holy days." We transform previous data accordingly.

[8]This measure assesses a current social norm that may differ from the social norm affecting respondents in their childhood. However, we are interested on the contemporaneous effect of the current social norm. Besides, we expect this social norm to be rather stable, as is the case with other cultural traits (e.g., Alesina and Giuliano, 2010, regarding values concerning the family).

practice, the variable is expressed in logarithmic terms (Deaton, 2008).

We use as a proxy for the level of health the average response to the question: "All in all, how would you describe your state of health these days? Would you say it is 'very good,' 'good,' 'fair,' or 'poor'?"[9] Notwithstanding this measure seems especially prone to the issue of reverse causality, it is widely supported by the specialized literature as a measure of physical health; and the fact it may inform also about mental health may be considered a positive feature because mental health has to be taken into account in a well specified model of subjective well-being (Clark et al., 2017).

Social support is measured as the average of an index that assesses the values of individuals about the family and friends. The index is constructed adding the numerical responses to two questions on the importance of the family and friends in respondent's life, which can take values from 1 ("very important") to 4 ("none at all important"). We reverse the order of the responses to facilitate their interpretation. The possible values of the average social support index range from 2 to 8. The importance of the family has been previously used in measures of family ties (Alesina & Giuliano, 2010); and along with the importance of friends these measures have been used as proxies for bonding and bridging social capital, respectively (Pugno & Verme, 2012). Helliwell et al. (2017) point out the need for measures of social support assessing the contributions of both family and friends. In this regard, some evidence shows the importance of including both sources of social support (Pugno & Verme, 2012).

Attending to Helliwell et al. (2017), collective social capital is measured as the average of an index of social trust and confidence in two relevant public institutions: police and parliament.[10] The index is constructed adding the numerical responses to three different questions. The first one assesses whether individuals believe that most people can be trusted or they otherwise think that one needs to be very careful in dealing with people. The responses take the values of 1 and 2 respectively. The questions that assess confidence in the police and the parliament include four possible response categories ranging from 1 ("great deal of confidence") to 4 ("none at all"). We reverse the order of the responses to facilitate their interpretation. The possible values of the average collective social capital index range from 3 to 10.

We measure the level of freedom as the average response to the question: "Some

[9] In the EVS and first three waves of the WVS this question includes five response categories: "very good," "good," "fair," "poor," and "very poor." Since the fourth wave of the WVS this health measure has been transformed into a 4-point scale variable merging last two categories ("poor" and "very poor"). We transform previous data accordingly.

[10] Helliwell et al. (2017) mention four public institutions: police, legal system, parliament and politicians. We focus on police and parliament to maximise the sample size.

people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Please use this scale where 1 means 'no choice at all' and 10 means 'a great deal of choice' to indicate how much freedom of choice and control you feel you have over the way your life turns out," thus possible values range from 1 to 10.[11]

We finally have 261 country-year observations for a total of 101 countries during the period 1990-2014.[12] Table C.1 in appendix C shows the sample and Table C.2 the descriptive statistics of the main variables.

4.3.2 Empirical strategy

We are interested in the *ceteris paribus* relationship between religiosity and life satisfaction at country level. Following Helliwell and Wang (2013) we estimate pooled OLS models for country-year observations. Importantly, given that the final panel is rather unbalanced because the IVS polls a different set of countries by study and round, we weight the observations to avoid results are driven by the greater availability of some countries. Countries are classified into ten different world regions as defined in the World Happiness Report –which mostly relies on the World Bank categorization by geographic region– that are thought to respond to different "regional histories, social norms and cultural conditions" (Bonini, 2008, p. 225).[13] Regional dummies may pick up cultural differences –for instance in the way in which self-reported questions are answered– and other institutional factors not controlled for. Besides, all models include year fixed effects and we estimate robust standard errors clustered by country.[14]

The most comprehensive specification of the life satisfaction equation that we will estimate takes the following form (for the sake of clarity we do not include a bar on top of the variables albeit they represent mean values):

[11]Due to data constraints we do not control for generosity in our main estimations, however we would perform some robustness checks controlling for altruism using a smaller sample and data from Helliwell et al. (2019).

[12]We keep individuals aged 18+ years. We drop observations from Bosnia from the third wave of the WVS because the sample is not representative of Bosnia-Herzegovina. We merge observations from Northern Cyprus and Cyprus from the fourth wave of the EVS to have representative data for Cyprus at a whole –observations are weighted according to the population of each of these entities in that year according to the Statistical Service Republic of Cyprus (2009). Regarding observations from Serbia and Montenegro from the fifth wave of the WVS, according to the study description included in the results book of the fifth wave the target population was the population of Serbia of voting age, therefore we assign such observations to Serbia.

[13]Western Europe; Central and Eastern Europe; Commonwealth of Independent States; South Asia; South-east Asia; East Asia; Latin America and the Caribbean; North America, Australia and New Zealand; Middle East and North Africa; and Sub-Saharan Africa.

[14]All computations were performed with R version 3.6.1 (R Core Team, 2018), using the package *clubSandwich* (Pustejovsky, 2019) for the estimation of cluster-robust standard errors.

$$LS_{it} = \alpha + \boldsymbol{\beta}_1^{'}\mathbf{R_{it}} + \boldsymbol{\beta}_2^{'}\mathbf{I_{it}} + \boldsymbol{\gamma}^{'}\mathbf{X_{it}} + \boldsymbol{\delta}^{'}\mathbf{W_i} + \boldsymbol{\xi}^{'}\mathbf{Y_t} + u_{it}, \tag{4.1}$$

where LS_{it} refers to mean life satisfaction in a given country-year. $\mathbf{R_{it}}$ is a vector of measures of religiosity: *attend*, *religious*, and *god*, in a given country-year. $\mathbf{I_{it}}$ accounts for a vector of social measures of religious introjection: *chfaith* and *hell*, in a given country-year. $\mathbf{X_{it}}$ is a vector that includes main country-year characteristics: the logarithm of the GDP per capita, the mean value of the index of social support, the average responses to the self-reported health and the freedom questions, and the mean score in the index of collective social capital. $\mathbf{W_i}$ is a vector of regional dummies where Western Europe is the reference category. $\mathbf{Y_t}$ is a vector of year dummies. Finally, u_{it} is the error term corresponding to country i in year t.

It is important to control for the main factors affecting average life satisfaction included in vector $\mathbf{X_{it}}$ because they may otherwise confound the relationship of interest due to the substitutive role of religion. On the other hand, these factors may mediate the relationship between religiosity and average life satisfaction. In this regard our estimations may be conservative and only capture the direct link between the variables of interest. However, as far as the estimations may also reflect reverse causality we cannot claim causal interpretations. In the next section we would discuss possible endogeneity issues affecting the religious variables in detail.

Due to the novelty of our interpretation of *chfaith* and *hell* as measures of religious introjection we will carry out a preliminary analysis to support such interpretation. As we expect the measures of religious introjection and the aggregate level of religiosity to be highly correlated we will try to discriminate between them based on their different partial correlations with a given outcome variable. This is precisely what we do in the life satisfaction equation, but we may reinforce that eventual result by estimating an auxiliary regression using *blessed* –the proportion of the population that derives some comfort and strength from religion– as the dependent variable. Moreover, this auxiliary regression may also provide a first insight into which aspects of religiosity –whether social-institutional or personal– are more important for subjective well-being.

$$blessed_{it} = \mu + \boldsymbol{\pi}^{'}\mathbf{R_{it}} + \boldsymbol{\rho}^{'}\mathbf{I_{it}} + \boldsymbol{\vartheta}^{'}\mathbf{X_{it}} + \boldsymbol{\tau}^{'}\mathbf{W_i} + \boldsymbol{\varphi}^{'}\mathbf{Y_t} + \varepsilon_{it}. \tag{4.2}$$

Similarly to life satisfaction, we explain *blessed* on the basis of religiosity ($\mathbf{R_{it}}$) and religious introjection ($\mathbf{I_{it}}$) variables, country-year characteristics ($\mathbf{X_{it}}$) and a set of regional ($\mathbf{W_i}$) and year ($\mathbf{Y_t}$) fixed effects. Because of the negative effect of religious introjection on well-being (Ryan et al., 1993) we expect the components

of the vector of population parameters $\boldsymbol{\rho}$ to be non-positive. The components of $\boldsymbol{\pi}$ represent the *ceteris paribus* associations between each dimension of religiosity and the feeling of comfort and strength derived from religion.

4.4 Results

In this section we would firstly analyse the religious variables used in this research and search for some first evidence supporting our interpretation of *chfaith* and *hell* as measures of religious introjection and not merely as measures of religiosity. Then we would carry out our main empirical exercise estimating various specifications of the life satisfaction equation. Firstly, a benchmark model without religious variables to check whether the estimation is consistent with standard literature results. Secondly, a model that includes the measures of religiosity to check whether the aggregate religion puzzle holds. Thirdly, we may include the measures of religious introjection trying to shed new light on the aggregate religion puzzle. This section would conclude with some robustness checks and a discussion of the possible endogeneity problems.

4.4.1 Religious phenomenon

Table 4.1 displays pairwise correlations of all the religious variables used in this research. It shows that in general all variables correlate very strongly with each other; especially *god*, which presents the highest correlations with the other two measures of religiosity (*attend* and *religious*) and is very strongly correlated with the two measures of religious introjection (*chfaith* and *hell*). The latter are also very strongly correlated between them. In general, as was expected, all the three variables that measure the aggregate level of religiosity are highly and positively correlated with the two variables that assess the level of religious introjection. Therefore, to support the implicit assumption that those two sets of variables actually correspond with two different religious factors we would try to discriminate among them by comparing their role in Equation 4.2.

Table 4.2 displays the estimation results of three different specifications of Equation 4.2. The first column shows the estimation of a model that only includes the set of religious variables that are supposed to proxy for religiosity. Only the variables that proxy for the personal aspect of religiosity emerge significantly associated with *blessed*. The adjusted R-squared of the model is 0.91. Model 2 only includes the pair of religious variables that are supposed to proxy for religious introjection. Both emerge strongly and significantly associated with *blessed*. Interestingly, the propor-

Table 4.1: Religious variables: correlation matrix

	attend	*religious*	*god*	*chfaith*	*hell*
attend	1				
religious	0.671	1			
god	0.801	0.749	1		
chfaith	0.763	0.673	0.856	1	
hell	0.736	0.557	0.863	0.813	1

Source: Authors.
Data: WVS (2015) and EVS (2015).
Notes: Correlations computed using all units of analysis (country-years) available for each pair of variables.

tion of the variance explained by the model is smaller (adjusted R-squared = 0.8) and other controls emerge more strongly associated with the dependent variable. In model 3 both set of controls are included. We can see that the adjusted R-squared is almost equal to that of model 1 (0.9), thus the inclusion of the two variables that are supposed to proxy for religious introjection does not add to the explaining power of the model. Moreover, neither *chfaith* nor *hell* is significantly associated with *blessed* in this specification.

These results are consistent with the interpretation that variables *chfaith* and *hell* provide well-being at the aggregate level, in terms of the proportion of individuals that get comfort and strength from religion, by enhancing the personal dimension of religiosity. As would be expected as proxies for the extent of religious introjection, their effect is exhausted by that mechanism. Moreover, countries with a higher prevalence of religious introjection are not penalized in terms of the proportion of individuals that get comfort and strength from religion. This is reasonable given that we are studying a source of well-being that can hardly play a significant role in less religious societies.

4.4.2 Religiosity and life satisfaction across countries

Turning to the life satisfaction equation, Table 4.3 shows the estimations of five standard specifications of Equation 4.1. Model 0 is the benchmark model and does not include religious variables. The regression coefficients have all the expected signs, and all but one, associated with social support, are highly significant. The model explains an 84% of the variation in average life satisfaction.

Models 1-4 include the variables that proxy for the aggregate level of religiosity. In line with previous literature, we find no significant correlation between any aspect of religiosity and life satisfaction. We should remark that in models 1-4 we

Table 4.2: Regressions to explain comfort and strength derived from religion

Independent variables	Model 1	Model 2	Model 3
Religiosity			
Attend	0.027		0.019
	(0.017)		(0.017)
Religious	0.146		0.148
	(0.062)**		(0.063)**
God	0.091		0.091
	(0.009)***		(0.011)***
Religious introjection			
Chfaith		0.240	0.018
		(0.079)***	(0.048)
Hell		0.483	0.006
		(0.067)***	(0.057)
Controls			
Log GDP per capita	-0.006	-0.058	-0.014
	(0.010)	(0.020)***	(0.012)
Health	-0.050	0.034	-0.064
	(0.037)	(0.051)	(0.038)
Social support	-0.039	-0.050	-0.033
	(0.021)*	(0.037)	(0.023)
Collective social capital	-0.026	-0.043	-0.018
	(0.012)**	(0.015)***	(0.011)
Freedom	0.019	0.026	0.012
	(0.010)*	(0.015)*	(0.010)
Number of countries	79	77	77
Number of observations	152	151	150
Adjusted R-squared	0.910	0.803	0.902

Source: Authors.
Data: WVS (2015), EVS (2015) and World Bank (2018).
Notes: weighted pooled OLS regressions. All models include regional and years fixed effects. Coefficients are reported with robust standard errors clustered by country in parentheses. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively.

control for the level of freedom enjoyed by individuals, which in light of Hayward and Elliot's (2014) results could had been enough to control for non-autonomous kinds of religiosity and thus observe some significant association between religiosity and average life satisfaction. However this is not the case. In fact, the coefficient associated with freedom hardly changes from model 0 to models 1-4, and moreover the coefficients associated with the religious variables are rather close to zero.

Table 4.4 displays estimations of different specifications of Equation 4.1 that, in addition to the variables that proxy for the aggregate level of religiosity, also in-

Table 4.3: Regressions to explain average life satisfaction across countries: Religiosity

Independent variables	Model 0	Model 1	Model 2	Model 3	Model 4
Religiosity					
Attend		0.031			0.051
		(0.044)			(0.059)
Religious			0.034		-0.044
			(0.222)		(0.243)
God				0.003	-0.013
				(0.026)	(0.035)
Controls					
Log GDP per capita	0.143	0.147	0.153	0.142	0.152
	(0.053)***	(0.053)***	(0.055)***	(0.053)***	(0.054)***
Health	0.516	0.501	0.391	0.445	0.377
	(0.182)***	(0.189)***	(0.185)**	(0.183)**	(0.195)*
Social support	0.221	0.227	0.314	0.267	0.329
	(0.164)	(0.165)	(0.163)*	(0.158)*	(0.161)**
Collective social capital	0.181	0.188	0.201	0.186	0.203
	(0.054)***	(0.056)***	(0.052)***	(0.054)***	(0.054)***
Freedom	0.628	0.629	0.629	0.624	0.638
	(0.070)***	(0.070)***	(0.067)***	(0.068)***	(0.066)***
Number of countries	101	101	101	101	101
Number of observations	261	261	259	259	258
Adjusted R-squared	0.84	0.839	0.846	0.842	0.845

Source: Authors.
Data: WVS (2015), EVS (2015) and World Bank (2018).
Notes: weighted pooled OLS regressions. All models include regional and years fixed effects. Coefficients are reported with robust standard errors clustered by country in parentheses. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively.

clude the variables that proxy for the extent of religious introjection. The estimated association between the latter and mean life satisfaction is negative, as expected. Moreover, the association between *chfaith* and life satisfaction is statistically significant at standard levels in all models. Importantly, once either of the measures of religious introjection is included in the model, the variable that proxy for the social dimension of religiosity: *attend*, becomes larger in size –as compared with models 1 and 4 in Table 4.3– and statistically significant. The only exception is model 11, in which all the three measures of religiosity are included. On the contrary, both proxies for the personal dimension of religiosity fail to be significantly associated with average life satisfaction –only in one model the coefficient associated with god emerges marginally significant–. Thus, regarding the aggregate level of life satisfaction, it seems that the only relevant aspect is the social dimension of religiosity

–albeit the fact that attend does not emerge significantly associated with average life satisfaction in model 11 precludes a more definitive statement in this regard.[15] These results are somehow at odds with those obtained for the *blessed* equation, but are consistent with those of Graham and Crown (2014), who using different data found that the spiritual or purposeful aspect of religiosity does not hold for evaluative wellbeing.

The coefficients of the remaining controls are in general not much affected by the inclusion of the religious variables. Moreover, according to the adjusted R-squared, the inclusion of the religious variables increases the explaining power of the model by around one-half percentage point. Focusing on model 5, it is estimated that an increase of one standard deviation in *attend* may be associated with an increase of around one-tenth of a standard deviation in the life satisfaction scale. This effect is equivalent to that produced by an increase of one standard deviation in the index of collective social capital or around two-thirds of a standard deviation in the self-reported health measure. Importantly, that positive change would be cancelled out if it were accompanied by a similar increase (three-quarters of a standard deviation) in the proportion of individuals considering that religious faith is a quality children must be encouraged to learn at home.

4.4.3 Robustness checks

The IVS includes two different measures of cognitive subjective well-being: one refers to life satisfaction and the other one to overall happiness. Given that these two questions are not adjacent in the questionnaire we may use the question on overall happiness –"Taking all things together, would you say you are: very happy, quite happy, not very happy, or not at all happy?"[16]– to test the reliability and inter-temporal stability of the life satisfaction measure (Clark & Lelkes, 2009). However, it should be taken into account that responses to the happiness question have been found to rely more on affects (Helliwell et al., 2015) than responses to the life satisfaction question. Interestingly, results using average happiness as the dependent variable are consistent with those findings.

Table 4.5 shows that *attend* already emerges as significantly associated with happiness in model 4 –and is almost marginally significant in model 1– in which we do

[15]The estimation of model 11 suggests that the coefficient on *attend* in model 5 is capturing part of the effect of the other two religiosity variables. In this regard, the joint contribution of the three religiosity variables is almost marginally significant in model 11, although we cannot reject the hypothesis that the coefficients on attend, religious, and god are zero (F = 2.065, p-value = 0.106).

[16]In the last two rounds of the WVS (fifth and sixth) the wording of the second response category has changed from "rather happy" to "quite happy."

Table 4.4: Regressions to explain average life satisfaction across countries: Religiosity and religious introjection

Independent variables	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
Religiosity									
Attend	0.113	0.207					0.065	0.204	0.233
	(0.053)**	(0.091)**					(0.060)	(0.093)**	(0.089)**
Religious			0.302	0.122			0.065	-0.17	-0.028
			(0.238)	(0.271)			(0.245)	(0.278)	(0.276)
God					0.057	0.056	0.035	0.026	0.044
					(0.032)*	(0.047)	(0.038)	(0.047)	(0.048)
Religious introjection									
Chfaith	-0.630		-0.450		-0.605		-0.679		-0.818
	(0.225)***		(0.217)**		(0.255)**		(0.266)**		(0.325)**
Hell		-0.564		-0.046		-0.318		-0.638	-0.35
		(0.354)		(0.221)		(0.342)		(0.398)	(0.405)
Controls									
Log GDP per capita	0.131	0.174	0.144	0.145	0.139	0.158	0.151	0.174	0.184
	(0.054)**	(0.067)**	(0.056)**	(0.069)**	(0.054)**	(0.068)**	(0.056)***	(0.067)**	(0.073)**
Health	0.537	0.357	0.434	0.286	0.468	0.288	0.4	0.351	0.317
	(0.192)***	(0.214)*	(0.188)**	(0.209)	(0.186)**	(0.211)	(0.201)**	(0.215)	(0.211)
Social support	0.277	0.431	0.33	0.501	0.293	0.481	0.363	0.432	0.478
	(0.160)*	(0.186)**	(0.155)**	(0.188)***	(0.151)*	(0.185)**	(0.155)**	(0.185)**	(0.177)***
Collective social capital	0.155	0.205	0.181	0.184	0.161	0.184	0.18	0.199	0.187
	(0.057)***	(0.065)***	(0.053)***	(0.060)***	(0.054)***	(0.062)***	(0.054)***	(0.062)***	(0.062)***
Freedom	0.638	0.671	0.629	0.662	0.615	0.654	0.631	0.668	0.663
	(0.069)***	(0.077)***	(0.067)***	(0.078)***	(0.069)***	(0.078)***	(0.067)***	(0.076)***	(0.075)***
Number of countries	101	92	101	92	101	92	101	92	92
Number of observations	261	202	259	202	259	202	258	202	202
Adjusted R-squared	0.845	0.847	0.848	0.841	0.846	0.842	0.85	0.845	0.851

Source: Authors. *Data:* WVS (2015), EVS (2015) and World Bank (2018). *Notes:* See notes in Table 4.3. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively.

not control for religious introjection. Therefore, there is no evidence of an aggregate puzzle regarding this measure of subjective well-being; something expected with measures of positive affect, but not with more evaluative measures (Deaton & Stone, 2013). Otherwise, results are very similar to those obtained using life satisfaction as the outcome variable, thus the personal dimension of religiosity does not contribute to overall happiness and *chfaith* is negatively and significantly associated with average happiness (model 5).

Table 4.5: Regressions to explain average happiness across countries: Religiosity and religious introjection

Independent variables	Model 0	Model 1	Model 2	Model 3	Model 4	Model 5
Religiosity						
Attend		0.026			0.037	0.04
		(0.016)			(0.022)*	(0.023)*
Religious			0.047		-0.033	-0.006
			(0.081)		(0.104)	(0.105)
God				0.008	-0.004	0.007
				(0.009)	(0.014)	(0.015)
Religious introjection						
Chfaith						-0.167
						(0.096)*
Controls						
Log GDP pc	0.019	0.022	0.019	0.02	0.02	0.02
	(0.022)	(0.021)	(0.02)	(0.019)	(0.019)	(0.02)
Health	0.337	0.326	0.273	0.262	0.258	0.264
	(0.101)***	(0.100)***	(0.079)***	(0.081)***	(0.077)***	(0.076)***
Social support	0.109	0.114	0.158	0.153	0.17	0.179
	(0.071)	(0.071)	(0.058)***	(0.057)***	(0.058)***	(0.059)***
Collective	0.079	0.085	0.087	0.085	0.089	0.084
	(0.023)***	(0.024)***	(0.022)***	(0.022)***	(0.022)***	(0.022)***
Freedom	0.072	0.073	0.065	0.068	0.07	0.069
	(0.034)**	(0.033)**	(0.032)**	(0.032)**	(0.032)**	(0.031)**
Num. count.	101	101	101	101	101	101
Num. obser.	261	261	259	259	258	258
Adjusted R^2	0.63	0.632	0.661	0.66	0.662	0.665

Source: Authors.
Data: WVS (2015), EVS (2015) and World Bank (2018).
Notes: weighted pooled OLS regressions. All models include regional and years fixed effects. Coefficients are reported with robust standard errors clustered by country in parentheses. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively.

Moreover, neither the measure of social support nor the measure of collective social capital includes information about the density of associational activity in the

country. Given that religiosity –especially its social dimension– may be capturing the effect of a lively civil society we could additionally control for the density of associational activity as measured by the average number of non-religious group memberships (*memberships*) reported per respondent in each country (Knack & Keefer, 1997). Regretfully, the question of the World Values Survey relating to this has changed over the years, thus working with fully comparable data reduces appreciably the sample size. In any case, results remain essentially unchanged (see Table C.3 in Appendix C).

Helliwell and Wang (2013) find that generosity is a factor that contributes significantly to explain the distribution of average life evaluations across countries. Taking into account that religious people are more likely to be altruistic (Clark & Lelkes, 2009) we have to control for this factor to avoid any possible confounding effect. Lacking a more specific measure, we use as a proxy for generosity the proportion of respondents in a country that are members of a humanitarian or charitable organization (*charity*). As was the case with the general measure *memberships*, including the variable *charity* does not alter main results (see Table C.4 in Appendix C).

We additionally check whether our results are robust to the inclusion of the proxies for generosity, social support and collective social capital used by Helliwell et al. (2019), who use data from the Gallup World Poll. We take their data on generosity, social support and perception of corruption from the World Happiness Report online appendix and combine these variables with our IVS data. Firstly, it must be noted that the strong negative association between our main proxy for religious introjection –*chfaith*– and mean life satisfaction proved robust (see Tables C.5, C.6, and C.7 in Appendix C).

Including Gallup's measures of generosity or social support in our models affects differently the estimation of the coefficient associated with *attend* –which gets reduced– and those associated with *religiosity* and *god* –which get increased–. Thus, the coefficient associated with the social dimension of religiosity seems to be partly capturing the effects of social support and generosity, which may be either channels through which religiosity exerts its effects or a confounding factor of the relationship of interest. On the other hand, our estimates of the association between the personal dimension of religiosity and life satisfaction may be partly biased downward due to the confounding effect of generosity and social support, which seem to be lower in more religious countries.

Finally, the inclusion of the Gallup's measure of corruption in our models reduces the estimated association between both the social and the personal aspects of religiosity, as measured by *attend* and *religious* respectively, and average life sat-

isfaction. This suggests that the estimated positive association between religiosity and average life satisfaction may be partly capturing the effect of collective social capital, which, once again, may be either a channel through which religiosity exerts it effects or a confounding factor of the relationship of interest. Precisely in the next section we deal with the issue of which may be the prevalent causal direction in these relationships.

4.4.4 Endogeneity issues

As previously stated, we cannot claim causality in the estimated associations between the religious variables and average life satisfaction. There are two potential sources of bias. Firs, we may have reverse causality, although it is not clear whether it is a higher or a lower level of life satisfaction which may enhance religiosity. In general it is thought that higher levels of subjective well-being enhance religiosity. We are unable to study this potential source of bias directly. However, as life satisfaction is a response/trait variable, the ultimate source of bias would be the factors underlying it. These underlying factors constitute the other potential source of bias and their relationship with religiosity can be more thoroughly discussed.

The second potential source of bias are omitted factors correlated with both the religious variables and average life satisfaction. Among them we are likely to have cultural traits and objective life circumstances.[17] Cultural traits are supposed to be controlled for by means of the regional dummies, although this control may be not perfect. Regarding objective life circumstances, under adverse selection the insurance role of religion entails that those who are worse off may be more religious. On the other hand, given that higher subjective well-being may enhance religiosity, we might expect that in certain circumstances the better the life conditions, which are positively associated with subjective well-being, the higher the level of religiosity. According to Graham and Crown's (2014) findings this is especially plausible regarding the personal dimension of religiosity.

Following Clark and Lelkes (2006), we may discuss the potential effect of endogeneity issues on our estimations studying the relationship between changes in the religious variables and changes in the life conditions (GDP per capita, health, social support, collective social capital, and freedom) exploiting the panel nature of the data. To this end we define a set of binary variables indicating whether the value of the corresponding variable has increased significantly (at the 5% level) between two consecutive rounds of the survey. All changes in the GDP per capita are assumed significant, and with respect to the religious variables we also define a binary variable

[17]Personality traits are not expected to be a source of bias at the country level.

indicating whether the corresponding measure has decreased significantly between two consecutive rounds of the survey. We focus on the variables *attend*, *god*, and *chfaith* We estimate linear probability models of a rise/drop in religiosity and religious introjection on the binary variables indicating significant positive variations in the life circumstances.

Table 4.6 displays the estimations of the different linear probability models.[18] The first column shows that drops in *attend* are significantly associated with rises in self-reported freedom. This finding suggests that in some cases attending religious services is not completely voluntary. Alternatively, interpreting overall freedom as a measure of the availability of resources in general, this finding is consistent with the role of religion as a substitute for other sources of life satisfaction.

Table 4.6: Linear probability models of significant changes in religious variables

Control variables: dummies significant increases in:	Drop *attend* (1)	Rise *attend* (2)	Drop *god* (3)	Rise *god* (4)	Drop *chfaith* (5)	Rise *chfaith* (6)
GDP per capita	0.084	-0.063	0.079	0.177	-0.13	0.049
	(0.127)	(0.139)	(0.092)	(0.092)*	(0.122)	(0.116)
Health	-0.025	-0.027	-0.04	-0.025	0.142	-0.124
	(0.086)	(0.097)	(0.084)	(0.083)	(0.104)	(0.093)
Social support	-0.063	0.149	-0.195	0.036	0.088	-0.05
	(0.097)	(0.094)	(0.073)***	(0.090)	(0.099)	(0.083)
Col. social capital	-0.04	0.116	-0.08	0.056	-0.082	-0.037
	(0.087)	(0.088)	(0.083)	(0.090)	(0.092)	(0.088)
Freedom	0.277	-0.082	-0.125	0.327	-0.151	0.099
	(0.107)**	(0.098)	(0.074)*	(0.093)***	(0.103)	(0.096)
Num. of countries	64	64	64	64	64	64
Num. observations	125	125	125	125	125	125
Adjust. R-squared	0.034	0.067	0.289	0.222	0.093	0.057

Source: Authors.
Data: WVS (2015), EVS (2015) and World Bank (2018).
Notes: Weighted regressions to correct for the unbalanced nature of the panel. All models include regional fixed effects. Coefficients are reported with robust standard errors clustered by country in parentheses. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively.

Results are also suggestive for religious beliefs. Column 3 shows that increases in freedom and, especially, social support emerge negatively associated with drops in the strength of religious beliefs as measured by *god*. This finding is at odds with the substitutive role hypothesis. Turning to the prediction of a significant rise in god, results are consistent with the previous ones. Thus, column 4 shows that increases in

[18]Table C.9 in Appendix C shows the frequencies of the religious variables.

god are significantly associated with increases in the GDP per capita and freedom. These results point to the existence of a selection of stronger religious beliefs in those countries that experience an improvement in their life circumstances. Finally, changes in the measure of religious introjection (*chfaith*) do not emerge significantly associated with changes in any of the life conditions we are controlling for.

Consistent with Graham and Crown's (2014) findings, our results suggest that the usual caveat on reverse causality: the possibility that better-off individuals tend to be more religious, is especially pertinent regarding the personal dimension of religion. On the contrary, the social dimension of religion seems to be more susceptible to adverse selection as thriving societies –at least in terms of average self-perceived freedom– reduce their average frequency of attendance at religious services. Finally, results suggest that our main measure of religious introjection is less affected by short-term changes in average life conditions; and thus seems to capture a more stable cultural trait. These results reinforce our main findings on the positive relationship between the social-institutional dimension of religion and mean life satisfaction. Actually, given that adverse selection seems to be the main source of bias in this case, we can conclude that our estimates may be likely biased toward zero. This hypothesis is supported by the evidence that instrumental variable estimates are larger than the estimates obtained assuming exogeneity (Gruber, 2005; Popova, 2014).

4.5 Conclusions

Average life satisfaction varies across countries and time. Our results suggest that religiosity, as measured by the average frequency of attendance at religious services, explains part of such variations. To the best of our knowledge, this relationship had not been documented previously using a worldwide sample. Our results suggest that this relationship was previously masked by the type of religious regulation underlying the observance of religion (Ryan et al., 1993). Thus, in a standard regression model including only measures of both the social and the personal dimensions of religiosity we get the usual zero-correlation result (Deaton & Stone, 2013). However, once we additionally control for the extent of religious introjection, as measured by the proportion of individuals thinking religious faith is a quality children must be encouraged to learn at home and the proportion of individuals that believe in hell, we get a positive and significant correlation between the social dimension of religiosity and average life satisfaction. The association between the proxy for religious introjection concerning the education of the children and average life satisfaction is

estimated negative and significant.

The finding that only the social dimension of religiosity exerts an effect on average life satisfaction is consistent with Graham and Crown (2014). We have shown that main findings are not driven by using weak controls for social support or collective social capital or lacking a control for generosity. When we estimate the models using mean overall happiness as the dependent variable the results are consistent with previous findings on the relationship between religiosity and the affective component of subjective well-being at the cross-country level (Deaton & Stone, 2013) and further supports the hypothesis that measures of overall happiness reflect evaluations that rely strongly on affect. Finally, we have carried out a thorough discussion of the endogeneity issues that may affect our results exploiting the panel nature of the data. Overall, our results are consistent with Graham and Crown's (2014) finding that the strength of religious beliefs seems to be more subjected to the issue of reverse causality than the social dimension of religiosity, which seems more prone to the issue of adverse selection. Given that our main results concern the social dimension of religiosity and a measure of religious introjection whose changes are found uncorrelated with the changes in objective life conditions we are relatively confident about the reliability of our results, which seem more likely to be biased toward zero than inflated.

The findings of the previous literature regarding the insurance role of religion and the lack of a cross-country correlation between average levels of religiosity and cognitive subjective well-being are consistent with the secularization hypothesis. However this theory is unable to explain the fact that religiosity is still relatively high in countries where life circumstances may suggest otherwise (Deaton & Stone, 2013). The finding that after controlling for the type of religious regulation the aggregate levels of religiosity and life satisfaction are positively associated points to a possible explanation for the different evolution of the religious phenomenon across countries. Our findings encourage further research in this regard. Moreover, our findings are consistent with the evidence found at the individual level, thus reinforcing such evidence and its implications, in particular that religions play functions other than insuring. This encourages further research into the mechanisms and potential secular alternatives to religiosity.

Regarding the proposed proxies for religious introjection, our interpretation is consistent with the results, albeit more specific measures may be needed. On the other hand, future research may adopt different empirical strategies to avoid endogeneity problems. In this regard, it would be very interesting to exploit rapid changes in the religious map in regions such as Latin America (Somma et al., 2017).

Besides, in this research we have assumed that there is religious homogeneity within countries or that the possible religious fractionalization has no effect on the relationship of interest. However, it has been shown that religious homogeneity is positively associated with average life evaluations (Graham & Crown, 2014; Mookerjee & Beron, 2005). Therefore, future research may have to study the possible influence of religious fractionalization on the relationship between religiosity and average life satisfaction. Finally, it would be interesting to study the possible connexion between our results and those in Bjørnskov et al. (2008), who find that countries with a Christian majority have a life satisfaction premium.

Chapter 5

Conclusions

5.1 The role of the economics of happiness in happiness studies and policy

Measures of subjective well-being provide a valuable perspective on individual welfare and have been used in a number of interrelated lines of research. In the introduction we extensively discussed about the literature on the relationship between economic growth and subjective well-being. A natural extension was the inquiry on the determinants of subjective well-being in general.[1] This line of research "helps us to understand the critical determinants of individual welfare," and, regarding the evaluation of policies and institutions, it allows us "to uncover welfare consequences that are partly unobservable when traditional measures of economic and social progress such as national income are used" (Stutzer, 2020, p. 214). As Helliwell (2003) puts it:

> ... many public policies have effects on well-being that flow through productivity and incomes as well as through other channels. Conventional economic analysis can recognise the existence of these other channels, but if the effects are generally positive via one channel but negative through another channel, the net effects of the policy cannot be evaluated unless there is some method for comparing the sizes of the offsetting effects. If there are ways of tracking the offsetting influences through to subjective well-being, then measures of their relative size may be used to support inferences about the net effects of events or policies under review. (Helliwell, 2003, p. 333)

In this regard, an important strand of the literature employs the common currency used to evaluate the impact on well-being of different policy interventions and

[1] Some interesting research and survey papers in this regard are: Helliwell (2003); Dolan et al. (2008); Bjørnskov et al. (2008); Layard et al. (2012); and Clark (2018).

life circumstances: self-reported happiness, to value non-tangible and public goods which benefits are difficult to measure given that "the marginal utility to consumers is not reflected in market exchanges" (Stutzer, 2020, p. 215), such as the value attached to be married, or the costs of air pollution.[2] Based on this information, two kinds of applied welfare analysis are possible. On the one hand, the Life Satisfaction Approach transforms into monetary terms the consequences of policy interventions and carry out a cost-benefit analysis. On the other hand, in the wellbeing cost-effectiveness analysis the benefits are kept in well-being terms –to avoid the issues linked to the estimation of the marginal utility of income– and they are directly related to costs, thus evaluations are expressed in terms of well-being benefits per euro (Stutzer, 2020).

One important motivation for using subjective well-being data in public policy is the evidence that individuals systematically mispredict utility (Frey & Stutzer, 2014) and consequently some behavioural choices are suboptimal from an individual's perspective. In this regard, it is argued that "research can then seek to identify the conditions under which such choices are less likely or at least less harmful to the individual" (Stutzer, 2020, p. 214). Otherwise, in recent years research on the consequences of subjective well-being is gaining importance because it focus on social phenomena highly relevant for policy makers and economic agents. For instance, growing evidence shows that subjective well-being data may help predicting relevant political outcomes, such as government re-election (Herrin et al., 2018; G. Ward, 2020), the rise of populism (G. Ward, 2019), and the onset of peaceful uprisings (Witte et al., 2020). Other lines of research concern the positive effect of happiness on productivity (Clark, 2018) and its influence on migration decisions (Ivlevs, 2014).

Rightly, Stutzer (2020) point out that though all these promising results might seem to encourage a new paradigm in which public policy consists on solving technical valuation problems with the aim of maximizing individual welfare based on reported subjective well-being, this would be an error. In this regard, Stutzer notes that this social engineering perspective, "implicit in much reasoning about well-being policy," presents four major (interrelated) flaws. First, treating individuals as mere "metric stations", devoid of agency, is ethically questionable. Second, it is technically difficult to predict the consequences of alternative public policies and institutional arrangements because most available evidence is correlational and when it is well-founded it is difficult to extrapolate due to the likely heterogeneity in the

[2]Interpreting the happiness equation as a utility function, the coefficients associated to the different determinants represent their marginal utilities.

effects depending on the context. Moreover, he argues that the happiness approach is very limited in terms of capturing equilibrium effects and thus is seriously subject to potential (unintended) side effects. Third, we may expect that some mechanical implementation of well-being measures in the policy process would induce the government, public bureaucracy and various interest groups to manipulate them. Four, the social engineering perspective is conceptually problematic because one key lesson of the happiness literature refers to the importance of the feelings of autonomy, agency or personal control for people's well-being: they do not only care about final outcomes but also about processes, and the latter are neglected by technocratic approaches.

Stutzer (2020) advocates using happiness research to provide insights that improve the diagnoses of social problems and to help us to evaluate alternative institutional arrangements in order to address them. We agree with this author that the main contribution of happiness research may be to provide public debates and political processes with valuable information, and all research carried out on the occasion of this thesis was motivated by this goal.

5.2 Main contributions of the thesis (included one paradox)

With the aim of contributing to general knowledge about the distribution of average life satisfaction and its determinants across countries, in this thesis we have made extensive use of cluster analysis, a statistical technique that allows us to identify groups of countries on the basis of the similarities and differences among them and also fully characterize such groups. The resulting classifications may eventually allow us to carry out more nuanced analyses of the life satisfaction phenomenon and, moreover, they may provide us key insights regarding the meaning and measurement of well-being and its sustainability.

Regarding the distribution of average life satisfaction and its main determinants across countries, we have firstly carried out a cluster analysis on 103 countries covering all the main world regions using as classification variables average levels of life satisfaction, income, health, social ties, collective social capital, and freedom. This analysis is complementary to usual regression analyses that show that all these factors are universal sources of life satisfaction. We have identified five groups of countries with distinct patterns in the joint distribution of the clustering variables. If we try to summarize the main characteristics of each group in a single label we may named the different groups as follows:

- *Dissatisfied socially lacking societies*: group that consists of the European ex-communist countries (but those from the Balkans) and Peru, characterized by showing very low levels of social ties, collective social capital, and life satisfaction.

- *Dissatisfied traditional societies*: group that consists of countries from North and East Africa, the Balkans, Middle East, and South Asia, characterized by combining high levels of social ties with low levels of income, individual freedom and life satisfaction.

- *Satisfied free and attached, albeit dysfunctional, societies*: group which core members are Latino American countries, characterized by combining very high levels of individual freedom, social ties, and life satisfaction with very low levels of collective social capital.

- *Satisfied flourishing societies*: group that includes Scandinavian countries and those from the Anglosphere (UK, Ireland, US, Canada, Australia, and New Zealand), characterized by showing very high levels in all the variables.

- *Moderately satisfied striving societies*: group that includes countries from Western (continental) Europe and East Asia, characterized by showing high levels of income and collective social capital, and moderately high levels of life satisfaction, but relatively low levels of social ties and freedom as compared with the previous two clusters.

As compared with the groups that have been identified by the previous literature, the contribution of our classification is twofold. First, contrary to the previous literature that usually simply refers to the cultural differences and at most points out a particular distinct characteristic of the groups, our life satisfaction taxonomy fully characterizes these groups. Second, the proposed life satisfaction taxonomy shows that some of the groups identified by the previous literature are not as compact as it is usually assumed.

Subsequently we have carried out another cluster analysis, now over a specific set of determinants of subjective well-being referred to as the social foundations of happiness. We have used as clustering variables proxies for four important social aspects: social support, individual freedom, altruism, and collective social capital, and, additionally, proxies for two different sources of social support and sociality: traditional family ties and friendship ties, which may allow us to identify possible trade-offs between social support and individual freedom. We have identified four groups of countries with distinct patterns in the joint distribution of the six clustering

variables. On the basis of the main social context characteristics of the different clusters: the levels of social support, individual freedom, and social cohesion (as measured by the indicators of collective social capital and generosity), we have established a typology of countries displayed in Table 5.1.

Table 5.1: Social context typology

Type	Social support	Individual freedom	Social cohesion	Geographical pattern
HHH	High	High	High	Western Europe and the Anglosphere
HML	High	Moderate	Low	Ibero-America and Central and Eastern Europe
LLL	Low	Low	Low	Africa, Balkans, Middle East, Caucasus, and Central Asia
LMH	Low	Moderate	High	South and Southeast Asia

Source: Author.

The two classifications of countries proposed in the thesis show interesting patterns in the data. The special characteristics of each of the clusters encourage research on possible heterogeneities across clusters regarding the sources of life satisfaction, the characteristics of the distribution of life satisfaction beyond the mean, and the relationships between the different sources of life satisfaction.

Moreover, both the life satisfaction and social context classifications may usefully contribute to research on the meaning and measurement of well-being and its sustainability. In this regard, measures of subjective well-being are praised for helping us to identify key sources of well-being (Krueger & Stone, 2014; Layard, 2010; Oswald, 1997), and the findings of the economics of happiness regarding the well-being consequences of economic growth have contributed to a wider academic movement that points out the limitations of standard measures of GDP (and allied measures) as indicators of development (Deaton & Stone, 2013; Di Tella & MacCulloch, 2008). Evidence shows that economic growth is not necessarily associated with greater average happiness but that the evolution of the latter depends on a number of contextual factors, such as social trust and inequality, that may be also affected during the process (Mikucka et al., 2017, Pugno & Sarracino, 2019).

Accordingly, there is a growing consensus on the necessity, in order to improve the information available to the public, of including subjective well-being data in the dashboard of indicators "aimed at providing a comprehensive picture of current well-being and of its sustainability" (Stiglitz et al., 2018, p. 34). In this regard, Stiglitz et al. (2018) note that fully accounting for the consequences of economic downturns requires monitoring subjective well-being. More generally, it should be noted that it is unlikely that we would be truly aware of the difficult situation of the United States (Graham, 2017) or Italy (Pugno & Sarracino, 2019) without information about their

subjective well-being trends (and similarly we may think that the happiness data of flourishing countries complement objective indicators providing important insights).

On the other hand, as we discussed in the introduction, subjective well-being data have limitations and should be complemented with other indicators to provide a "comprehensive picture of current well-being and of its sustainability." A natural and interesting extension may be to use the factors included in the happiness equation as "dashboard of indicators" and apply suitable analyses to deal with such multivariate data. In particular, it is noteworthy that both classifications show that different configurations of the classification variables may be associated with similar levels of life satisfaction.

Importantly, crossing the two different classifications proposed in this thesis, it emerges a seemingly striking incongruence. In the life satisfaction taxonomy, countries from Central and East Europe are deemed as a group of socially lacking societies that show low levels of social ties, whereas they are regarded as countries with high levels of social support in the social context classification. In the opposite case are many countries from Africa, the Balkans, Middle East, and Central Asia, which show high levels of social ties in the life satisfaction taxonomy but low levels of social support in the social context classification. The point is that measures of social ties are often used as proxies for social support. It is justified arguing that social ties are likely a mechanism aimed at enhancing social support, an assumption that is consistent with some evidence concerning family ties (Alesina & Giuliano, 2007) and indices of family and friendship ties (Domínguez & López-Noval, 2020). However, as we dug deeper in the concept of social foundations of happiness and, particularly, in the social support and sociality dimension we find that family ties and social support, the latter as measured by the Gallup World Poll, are strongly negatively correlated at the aggregate level. We may comment further this paradoxical finding when discussing the limitations of our study.

In the last chapter of this thesis we have tried to shed light on the relationship between religiosity and life satisfaction at the cross-country level on the basis of the self-determination theory (SDT) (Ryan & Deci, 2000). The main conclusion we draw from our results is that, consistently with the predictions of the SDT, the prevalent regulatory style or motivation underlying the observance of the prescriptions of a given institution is crucial to understand the effects of such institution on subjective well-being. This evidence further supports a key finding of happiness studies: the importance for subjective well-being of the feelings of autonomy, agency, or personal control (Stutzer, 2020). This fact suggest that it would be interesting to complement data on subjective well-being with data on the underlying motivations to improve

our ability to explain the impact and predict the evolution of institutions such as religions.

5.3 Limitations and future research

Future research would be benefited from further improving the data. Regarding the role of the regulation style on the relationship between religiosity and life satisfaction at the aggregate level, it is important to search for more specific measures of the regulation style. We may also express doubts about the quality of the indicators of social support and sociality and individual freedom. Particularly, we have identified one paradoxical relationship between the measures of family ties and social support across countries that encourages us to search for alternative measures of both aspects to disentangle their links.

At this point we cannot explain that paradoxical relationship. The evidence suggest that the measure of family ties reflect indeed some sort of social support, however, are family ties otherwise a form of collectivism that enhances happiness not by promoting social support but through other channels (for instance as a source of meaning and purpose in life)? Are family ties linked to a kind of social support different to that which individuals assess when answering the Gallup question? Do cultural differences produce artefactual variation in any of the measures? Does social desirability inflate the measure of family ties in some countries? Is the Gallup measure of perceived availability of social support biased upwards with respect to actual availability differently across countries? We must leave these questions for future research. The only thing we can do to skip that apparent incongruence for the moment is to avoid thinking about the measure of social ties as a proxy for social support in the life satisfaction taxonomy pending such future research. In particular we may need to combine subjective and objective indicators to assess the possible role of social desirability and misprediction in our current proxies.

Similarly, the moderately high levels of social tolerance in a group of countries that otherwise presents very strong family ties (cluster that includes the LMH-type countries) deserves also further research using alternative proxies for individual freedom to explain this counter-intuitive relationship –in general, as suggested by the literature, there is a strong negative correlation between traditional family ties and our proxy for individual freedom–. Does this evidence indicate that our proxy for individual freedom performs poorly in most of the countries included in that cluster or there is a more interesting story behind our results? Importantly, the high levels of social cohesion shown by the countries of that cluster may play a role

in this issue.

We discussed in the introduction the worrying trends in subjective well-being and the social context in countries such as the United States and Italy in recent years. However, this fact is not apparent in the proposed life satisfaction and social context classifications, in which the United States is included among the *satisfied flourishing societies* and Italy among the *moderately satisfied striving societies* and both are classified as HHH-type countries respectively. Does this kind of evidence compromise the validity or utility of these classifications? First thing to note is that as we have argued elsewhere most of the factors included in the life satisfaction equation and the social context aspects are strongly persistent over time, so we do not expect dramatic changes in the classifications in the short run. Moreover, cluster analysis allows to study the situation of one particular country (globally or focusing on one particular characteristic) through its distance with respect to the centroid or other countries in its own cluster or those from other clusters.

However, though highly persistent, the determinants of average life evaluations are susceptible of significant changes, as the evidence regarding the United States and Italy shows. In this thesis we have aggregated data from multiple surveys carried out along several decades to cancel out possible short-term fluctuations of the data due to the economic cycle, which often vary across countries, and other contingent circumstances. However, as data covers increasingly longer periods and evidence suggests possible structural changes in the joint distribution of average life satisfaction and its determinants we should contemplate them. In this regard, cluster analysis can be carried out in different time periods to compare the groups found in each period and to analyse the dynamics of each country in comparative terms (Tezanos & Sumner, 2013).

Finally, in this thesis we have focused on the analysis of cognitive life evaluations. It would be necessary to carry out a more comprehensive analysis of the world distribution of subjective well-being (and its evolution) including other dimensions of this "broad category of phenomena" (E. Diener et al., 1999, p. 277). Thus, the same that we have argued that it is important to study the joint distribution of average life satisfaction and its determinants, it would be interesting to complement data on overall life evaluations with data on satisfaction with some specific life domains, such as work and family life, positive and negative affect, and mental health. In this regard, it is noteworthy the evidence provided by Helliwell et al. (2019) on the upward trend in negative affect since 2010 in the world. Period in which average life evaluations and positive affect have remained in general stable.

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Appendix A

Chapter 2 supplementary material

A.1 Tables

Table A.1: Data set

Country	ISO numb.	*lifesat*	*income*	*health*	*social*	*collective*	*freedom*
Albania	8	5.54	7000.75	3.85	1.15	1.28	5.65
Algeria	12	5.97	11999.96	3.63	1.37	1.06	6.66
Azerbaijan	31	5.8	7660.26	3.68	1.25	1.37	6.17
Argentina	32	7.37	16197.33	3.9	1.42	0.57	7.45
Australia	36	7.37	36720.91	4.05	1.53	1.57	7.63
Austria	40	7.79	41040.69	3.94	1.34	1.43	7.24
Bahrain	48	6.79	43837.34	3.92	0.86	1.78	6.88
Bangladesh	50	6.09	1596.75	3.55	1.2	1.54	5.98
Armenia	51	4.98	5298.96	3.4	1.38	0.91	6.12
Belgium	56	7.61	37907.77	3.94	1.35	1.35	6.48
Bosnia-Herzegovina	70	6.5	8395.58	3.79	1.4	1.04	6.62
Brazil	76	7.75	14002.51	3.96	1.22	0.76	7.71
Bulgaria	100	5.31	11634.33	3.56	1.26	0.93	5.83
Belarus	112	5.21	11131	3.15	1.18	1.27	5.74
Canada	124	7.78	39417.54	4.2	1.55	1.61	7.63
Chile	152	7.11	16268.27	3.78	1.21	1.06	7.17
China	156	6.77	7063.27	3.88	1.13	2.22	7.1
Colombia	170	8.32	9264.29	3.97	1.15	0.84	8
Croatia	191	6.6	17409.05	3.55	1.19	0.94	6.81
Cyprus	196	7.27	34013.02	4.12	1.5	1.2	7.46
Czechia	203	6.96	23564.61	3.69	1.18	0.83	6.71
Denmark	208	8.31	43876.2	4.21	1.46	2.25	7.56
Dominican Republic	214	7.13	6787.85	3.91	1.21	0.52	7.37
Ecuador	218	7.92	10665.46	3.96	1.31	0.84	7.86

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Country	ISO numb.	*lifesat*	*income*	*health*	*social*	*collective*	*freedom*
El Salvador	222	7.5	5634.01	3.83	1.62	0.95	7.5
Ethiopia	231	4.94	856.99	3.79	1.71	0.8	6.14
Estonia	233	6.06	20442.92	3.47	1.13	1.27	6.27
Finland	246	7.8	35498.12	3.79	1.37	1.92	7.54
France	250	6.98	36001.71	3.92	1.41	1.37	6.44
Georgia	268	5.08	5636.71	3.39	1.67	1	6.16
Germany	276	7.22	38649.87	3.8	1.27	1.44	6.94
Ghana	288	6.12	3165.79	4.23	1.39	1.23	7.19
Greece	300	6.81	28472.33	4.12	1.29	0.93	6.89
Guatemala	320	7.93	6213.12	3.8	1.42	0.52	7.44
Hong Kong	344	6.6	45722.87	3.66	1.06	1.75	6.57
Hungary	348	5.99	20681.57	3.51	1.29	0.99	6.22
Iceland	352	8.03	36353.98	4.12	1.5	1.9	7.75
India	356	5.66	3234.29	3.79	1.23	1.45	6.11
Indonesia	360	6.92	6709.76	3.88	1.55	1.35	7.35
Iran	364	6.4	15340.58	3.89	1.24	1.44	6.86
Iraq	368	5.03	11895.97	3.81	1.54	1.22	5.82
Ireland	372	7.98	40914.67	4.35	1.58	1.54	7.26
Italy	380	7.1	35927.89	3.81	1.3	1.38	6.07
Japan	392	6.78	34714.97	3.58	1.39	1.31	5.87
Kazakhstan	398	7.23	21276.93	3.7	1.41	1.56	7.03
Jordan	400	6.45	8526.36	4.16	1.5	1.63	7.39
Korea	410	6.36	23704.45	3.93	1.37	1.05	6.79
Kuwait	414	7.21	70832.37	4.26	1.49	1.5	7.97
Kyrgyzstan	417	6.77	2654.14	3.81	1.3	1.18	7.25
Lebanon	422	6.5	14402.3	3.98	1.31	0.87	6.97
Latvia	428	5.59	14286.53	3.32	0.94	0.89	5.9
Libya	434	7.25	16371.9	4.34	1.6	0.84	7.3
Lithuania	440	5.64	16480.51	3.41	0.86	0.75	6.51
Luxembourg	442	7.89	87124.97	4	1.39	1.7	6.95
Malaysia	458	7.01	21084.65	4.2	1.42	1.52	7.42
Mali	466	6.07	1784.88	3.84	1.51	1.42	6.11
Malta	470	8.03	26341.28	3.89	1.32	1.5	7.45
Mexico	484	8.07	11844.33	3.78	1.23	0.83	8.08
Moldova	498	5.27	3351.6	3.21	1.06	0.85	6.49
Montenegro	499	7.19	5937.5	3.67	1.42	1.09	7.54
Morocco	504	5.68	6252.38	4	1.35	1.13	5.86
Netherlands	528	7.76	38874.85	3.93	1.41	1.68	6.75
New Zealand	554	7.75	23668.62	4.13	1.51	1.59	7.85
Nigeria	566	6.59	4146.57	4.32	1.58	0.88	7.06
Norway	578	7.9	44182	4.13	1.52	2.23	7.47
Pakistan	586	5.97	4791.52	3.87	1.19	1.09	5.85

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Country	ISO numb.	*lifesat*	*income*	*health*	*social*	*collective*	*freedom*
Peru	604	6.75	7630.85	3.57	1.07	0.39	7.17
Philippines	608	6.95	5121.92	3.67	1.33	1.27	7.1
Poland	616	6.84	19166.82	3.54	1.24	0.98	6.52
Portugal	620	6.89	26639.51	3.85	1.15	1.32	6.53
Puerto Rico	630	8.25	68146.44	3.93	1.24	0.98	8.28
Qatar	634	8	9346.04	4.38	1.72	2.04	7.93
Romania	642	5.93	16920.44	3.58	1.13	0.79	7.22
Russia	643	5.52	15679.31	3.22	1.16	0.87	6.04
Rwanda	646	5.74	22525.64	3.67	1.39	1.56	6.7
Serbia	688	6.05	11693.47	3.53	1.4	0.81	6.4
Singapore	702	7.02	66463.31	4.06	1.4	1.84	6.89
Slovakia	703	6.51	19243.45	3.58	1.28	1.06	6.56
Viet Nam	704	6.86	3241.92	3.63	1.04	2.38	7.24
Slovenia	705	7.2	25861.81	3.62	1.31	0.95	7.36
South Africa	710	6.25	10715.72	4.09	1.29	1.36	6.96
Zimbabwe	716	5.06	2479.19	4.08	1.34	1.18	6.2
Spain	724	7.03	29492.61	3.91	1.31	1.36	6.76
Sweden	752	7.66	36657.29	4.06	1.57	1.98	7.56
Switzerland	756	8.05	51345.01	4.15	1.44	1.82	7.32
Thailand	764	7.37	37371.09	3.99	1.2	1.22	7.19
Trinidad and Tobago	780	7.4	22263.27	4.09	1.32	0.54	8.05
Tunisia	788	5.58	31012.72	3.91	1.46	0.85	6.64
Turkey	792	6.32	13367.1	3.72	1.67	1.37	5.9
Uganda	800	5.62	16783.44	3.91	1.66	1.4	6.78
Ukraine	804	5.04	9925.7	3.16	1.25	0.88	5.78
Macedonia	807	6	8288.27	3.89	1.57	0.9	6.5
Egypt	818	5.42	9267.53	3.72	1.4	1.54	5.9
United Kingdom	826	7.52	30445.5	3.97	1.54	1.34	7.18
Tanzania	834	3.86	37159.8	3.8	1.24	1.54	5.81
United States	840	7.49	41335.12	4.12	1.55	1.33	7.72
Burkina Faso	854	5.56	50598.95	3.95	1.51	1.06	5.71
Uruguay	858	7.37	21062.06	3.97	1.44	1.2	7.51
Uzbekistan	860	7.89	13485.55	3.95	1.5	1.94	7.8
Venezuela	862	7.12	11187.37	4.05	1.45	0.79	8.14
Yemen	887	5.89	14981.63	3.89	1.46	0.84	6.4
Zambia	894	6.06	3766.81	3.89	1.4	0.98	7.21
Kosovo	915	6.9	7530.63	3.8	1.16	1.47	6.56

Source: Authors.
Data: WVS (2015), EVS (2015) and World Bank (2018).
Notes: lifesat: Life satisfaction, *social*: Social ties, *collective*: Collective social capital. See Table 2.1 for the definitions of the variables.

Table A.2: Descriptive statistics of the data set

	Minimum	Maximum	Mean	Std. deviation
Life satisfaction	3.857	8.319	6.702	0.958
Income	856.995	87124.971	21271.318	17014.235
Health	3.149	4.377	3.844	0.262
Social ties	0.859	1.719	1.35	0.175
Collective social capital	0.387	2.378	1.251	0.412
Freedom	5.649	8.284	6.89	0.677

Source: Authors.
Data: WVS (2015), EVS (2015) and World Bank (2018).
Notes: See Table 2.1 for the definitions of the variables.

Table A.3: Correlation matrix

	lifesat	*income*	*health*	*social*	*collective*	*freedom*
lifesat	1					
income	0.444	1				
health	0.541	0.267	1			
social	0.17	0.026	0.506	1		
collective	0.276	0.286	0.321	0.15	1	
freedom	0.803	0.249	0.564	0.212	0.114	1

Source: Authors.
Data: WVS (2015), EVS (2015) and World Bank (2018).
Notes: lifesat: Life satisfaction, *social*: Social ties, *collective*: Collective social capital. See Table 2.1 for the definitions of the variables.

Table A.4: Agglomeration schedule

	Height	Component 1	Component 2
Cluster 1	0.20228317	Poland	Slovakia
Cluster 2	0.28527437	Denmark	Norway
Cluster 3	0.28964156	Brazil	Ecuador
Cluster 4	0.29027117	Germany	Spain
Cluster 5	0.29068363	Cyprus	United States
Cluster 6	0.29300726	Austria	Malta
Cluster 7	0.31215398	Canada	New Zealand
Cluster 8	0.31575299	Iceland	Sweden
Cluster 9	0.31635987	Belgium	France
Cluster 10	0.31820132	Croatia	Cluster 1
Cluster 11	0.33629115	Australia	Cluster 7
Cluster 12	0.36025982	Korea	Lebanon
Cluster 13	0.36225341	Macedonia	Yemen
Cluster 14	0.36404867	Albania	Pakistan
Cluster 15	0.37545308	Algeria	Serbia
Cluster 16	0.38254445	Colombia	Mexico
Cluster 17	0.40207039	Luxembourg	Netherlands
Cluster 18	0.41156868	United Kingdom	Uruguay
Cluster 19	0.41200715	Kyrgyzstan	Philippines
Cluster 20	0.41247055	Iran	South Africa
Cluster 21	0.42687572	Russia	Ukraine
Cluster 22	0.42963774	Azerbaijan	India
Cluster 23	0.43677626	Chile	Slovenia
Cluster 24	0.44402046	Czechia	Cluster 10
Cluster 25	0.45023846	Greece	Cluster 12
Cluster 26	0.46579322	Switzerland	Cluster 8
Cluster 27	0.46925178	Estonia	Hungary
Cluster 28	0.47623902	Italy	Cluster 9
Cluster 29	0.48603012	Singapore	Cluster 17
Cluster 30	0.48758806	Cluster 3	Cluster 16
Cluster 31	0.49466751	Belarus	Cluster 21
Cluster 32	0.50747704	Portugal	Cluster 4
Cluster 33	0.50837194	Cluster 5	Cluster 18
Cluster 34	0.5117072	Argentina	Guatemala
Cluster 35	0.514281	Bosnia and Herzegovina	Cluster 15
Cluster 36	0.51569513	Trinidad and Tobago	Venezuela
Cluster 37	0.5238814	Jordan	Malaysia
Cluster 38	0.5254567	Iraq	Egypt
Cluster 39	0.53181684	El Salvador	Indonesia
Cluster 40	0.54700964	Latvia	Lithuania
Cluster 41	0.55702292	Montenegro	Cluster 19
Cluster 42	0.5621526	Thailand	Cluster 6

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	Height	Component 1	Component 2
Cluster 43	0.56314553	Cluster 2	Cluster 26
Cluster 44	0.56610941	Armenia	Bulgaria
Cluster 45	0.56709419	Morocco	Zimbabwe
Cluster 46	0.58988948	Tunisia	Cluster 13
Cluster 47	0.60513674	China	Viet Nam
Cluster 48	0.61177184	Ghana	Zambia
Cluster 49	0.61352549	Finland	Uzbekistan
Cluster 50	0.61359741	Kuwait	Cluster 11
Cluster 51	0.65217428	Cluster 14	Cluster 22
Cluster 52	0.65781442	Peru	Romania
Cluster 53	0.66850634	Dominican Republic	Cluster 34
Cluster 54	0.67596888	Bahrain	Hong Kong
Cluster 55	0.68893678	Kosovo	Cluster 20
Cluster 56	0.69267413	Libya	Nigeria
Cluster 57	0.69722513	Ireland	Cluster 50
Cluster 58	0.69744491	Kazakhstan	Cluster 32
Cluster 59	0.77453175	Rwanda	Uganda
Cluster 60	0.79234906	Turkey	Cluster 38
Cluster 61	0.80061604	Japan	Cluster 28
Cluster 62	0.82684594	Cluster 24	Cluster 27
Cluster 63	0.84884761	Mali	Cluster 45
Cluster 64	0.91078466	Bangladesh	Cluster 51
Cluster 65	0.93095741	Cluster 33	Cluster 57
Cluster 66	0.94349607	Cluster 35	Cluster 46
Cluster 67	0.94718227	Cluster 42	Cluster 58
Cluster 68	0.9519839	Cluster 43	Cluster 49
Cluster 69	0.95562932	Cluster 31	Cluster 44
Cluster 70	0.95774759	Cluster 39	Cluster 41
Cluster 71	0.97212431	Moldova	Cluster 40
Cluster 72	0.9822002	Burkina Faso	Cluster 60
Cluster 73	0.98632923	Cluster 23	Cluster 67
Cluster 74	0.99908623	Cluster 30	Cluster 36
Cluster 75	1.07026109	Ethiopia	Georgia
Cluster 76	1.07483673	Cluster 25	Cluster 55
Cluster 77	1.08920844	Puerto Rico	Cluster 74
Cluster 78	1.09655596	Cluster 37	Cluster 65
Cluster 79	1.1419839	Cluster 59	Cluster 66
Cluster 80	1.1445955	Cluster 48	Cluster 70
Cluster 81	1.20359186	Cluster 63	Cluster 64
Cluster 82	1.30929941	Qatar	Cluster 68
Cluster 83	1.32862413	Cluster 52	Cluster 62
Cluster 84	1.33635423	Cluster 53	Cluster 77

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	Height	Component 1	Component 2
Cluster 85	1.39688467	Tanzania	Cluster 72
Cluster 86	1.4095841	Cluster 29	Cluster 61
Cluster 87	1.44847047	Cluster 73	Cluster 76
Cluster 88	1.47990568	Cluster 69	Cluster 71
Cluster 89	1.66511647	Cluster 56	Cluster 80
Cluster 90	1.69383426	Cluster 47	Cluster 54
Cluster 91	1.81120764	Cluster 79	Cluster 85
Cluster 92	1.8748947	Cluster 78	Cluster 82
Cluster 93	1.88160544	Cluster 86	Cluster 87
Cluster 94	2.117539	Cluster 75	Cluster 91
Cluster 95	2.44593135	Cluster 83	Cluster 88
Cluster 96	2.55428141	Cluster 81	Cluster 94
Cluster 97	2.68914169	Cluster 90	Cluster 93
Cluster 98	2.76618571	Cluster 84	Cluster 89
Cluster 99	4.0072097	Cluster 95	Cluster 96
Cluster 100	4.5113713	Cluster 92	Cluster 97
Cluster 101	4.58957604	Cluster 98	Cluster 100
Cluster 102	8.67591389	Cluster 99	Cluster 101

Source: Authors.
Data: WVS (2015), EVS (2015) and World Bank (2018).

Table A.5: Variance Ratio Criterion (VRC)

# clusters	VRC_k	w_k
2	48.996	—
3	35.919	11.01
4	33.853	1.505
5	33.291	-2.48
6	30.25	1.316
7	28.525	0.626
8	27.425	0.439
9	26.765	-0.259
10	25.846	—

Source: Authors.
Data: WVS (2015), EVS (2015) and World Bank (2018).
Notes: VRC implies choosing the cluster with minimum w. See Mooi and Sarstedt (2011, appendix of chap. 9) for a practical explanation of this criterion.

Table A.6: ANOVA output of the life satisfaction clusters

		Sum of squares	Df.	Mean Square	F value	Pr(>F)
Life satisfaction	Between	63.15	4	15.79	50.81	<0.01
	Within	30.45	98	0.31		
Income	Between	30.74	4	7.69	13.21	<0.01
	Within	57	98	0.58		
Health	Between	4.49	4	1.12	43.61	<0.01
	Within	2.52	98	0.03		
Social ties	Between	1.36	4	0.34	18.91	<0.01
	Within	1.77	98	0.02		
Collective	Between	9.03	4	2.26	26.62	<0.01
	Within	8.31	98	0.08		
Freedom	Between	33.9	4	8.48	64.46	<0.01
	Within	12.89	98	0.13		

Source: Authors.
Data: WVS (2015), EVS (2015) and World Bank (2018).
Notes: See Table 2.1 for definitions of the variables.

Table A.7: Cluster membership

Cluster 1 (n = 16)	Cluster 2 (n = 23)	Cluster 3 (n = 19)	Cluster 4 (n = 19)	Cluster 5 (n = 26)
Armenia	Albania	Argentina	Australia	Austria
Bulgaria	Algeria	Brazil	Canada	Bahrain
Belarus	Azerbaijan	Colombia	Cyprus	Belgium
Croatia	Bangladesh	Dominican Republic	Denmark	Chile
Czechia	Bosnia and Herzegovina	Ecuador	Finland	China
Estonia	Ethiopia	El Salvador	Iceland	France
Hungary	Georgia	Ghana	Ireland	Germany
Latvia	India	Guatemala	Jordan	Greece
Lithuania	Iraq	Indonesia	Kuwait	Hong Kong
Moldova	Mali	Kyrgyzstan	Malaysia	Iran
Peru	Morocco	Libya	New Zealand	Italy
Poland	Pakistan	Mexico	Norway	Japan
Romania	Rwanda	Montenegro	Qatar	Kazakhstan
Russia	Serbia	Nigeria	Sweden	Korea
Slovakia	Zimbabwe	Philippines	Switzerland	Lebanon
Ukraine	Tunisia	Puerto Rico	United Kingdom	Luxembourg
	Turkey	Trinidad and Tobago	United States	Malta
	Uganda	Venezuela	Uruguay	Netherlands
	Macedonia	Zambia	Uzbekistan	Portugal
	Egypt			Singapore
	Tanzania			Viet Nam
	Burkina Faso			Slovenia
	Yemen			South Africa
				Spain
				Thailand
				Kosovo

Source: Authors.

Table A.8: Means and standard deviations for clustering variables by selected subclusters

Subcluster	Countries	*lifesat*	*income*	*health*	*social*	*collective*	*freedom*
1.1 (n = 8)	Croatia, Czechia, Estonia, Hungary, Peru, Poland, Romania, Slovakia.	6.45 (0.41)	18132.46 (4719.64)	3.56 (0.07)	1.19 (0.08)	0.91 (0.26)	6.69 (0.37)
1.2 (n = 8)	Armenia, Bulgaria, Belarus, Latvia, Lithuania, Moldova, Russia, Ukraine.	5.32 (0.25)	10973.49 (4710.19)	3.3 (0.14)	1.14 (0.17)	0.92 (0.15)	6.05 (0.3)
3.1 (n = 10)	Argentina, Brazil, Colombia, Dominican Republic, Ecuador, Guatemala, Mexico, Puerto Rico, Trinidad and Tobago, Venezuela.	7.72 (0.44)	17657.2 (18348.33)	3.93 (0.09)	1.3 (0.1)	0.72 (0.17)	7.84 (0.33)
3.2 (n = 9)	El Salvador, Ghana, Indonesia, Kyrgyzstan, Libya, Montenegro, Nigeria, Philippines, Zambia.	6.82 (0.49)	5945.38 (4132.37)	3.96 (0.26)	1.47 (0.12)	1.09 (0.18)	7.28 (0.16)
5.1 (n = 4)	Bahrain, China, Hong Kong, Viet Nam.	6.76 (0.11)	24966.35 (22944.99)	3.77 (0.15)	1.02 (0.12)	2.03 (0.32)	6.95 (0.29)
5.2 (n = 22)	Austria, Belgium, Chile, France, Germany, Greece, Iran, Italy, Japan, Kazakhstan, Korea, Lebanon, Luxembourg, Malta, Netherlands, Portugal, Singapore, Slovenia, South Africa, Spain, Thailand, Kosovo.	7.1 (0.5)	31823.8 (17847.26)	3.89 (0.14)	1.31 (0.08)	1.34 (0.25)	6.83 (0.39)

Source: Authors.

Table A.9: Changing countries: cluster by clustering method

Country	Hierarchical	K-means	K-medoid
Croatia	1	1	2
Peru	1	1	2
Poland	1	1	2
Romania	1	1	2
Slovakia	1	1	2
Czechia	1	5	5
Serbia	2	1	2
Albania	2	2	1
Azerbaijan	2	2	1
Bangladesh	2	2	1
Georgia	2	2	1
Iraq	2	2	1
Pakistan	2	2	1
Egypt	2	2	1
Tanzania	2	2	1
Burkina Faso	2	2	1
Rwanda	2	5	5
Ghana	3	3	2
Indonesia	3	3	2
Kyrgyzstan	3	3	2
Nigeria	3	3	2
Philippines	3	3	2
Zambia	3	3	2
Libya	3	3	4
Puerto Rico	3	4	3
Uruguay	4	3	4
Lebanon	5	3	2
Slovenia	5	3	5
Malta	5	4	4
Austria	5	4	5
Luxembourg	5	4	5
Netherlands	5	4	5
Singapore	5	4	5
Kosovo	5	5	2
Changes		12	26

Source: Authors.

A.2 Figures

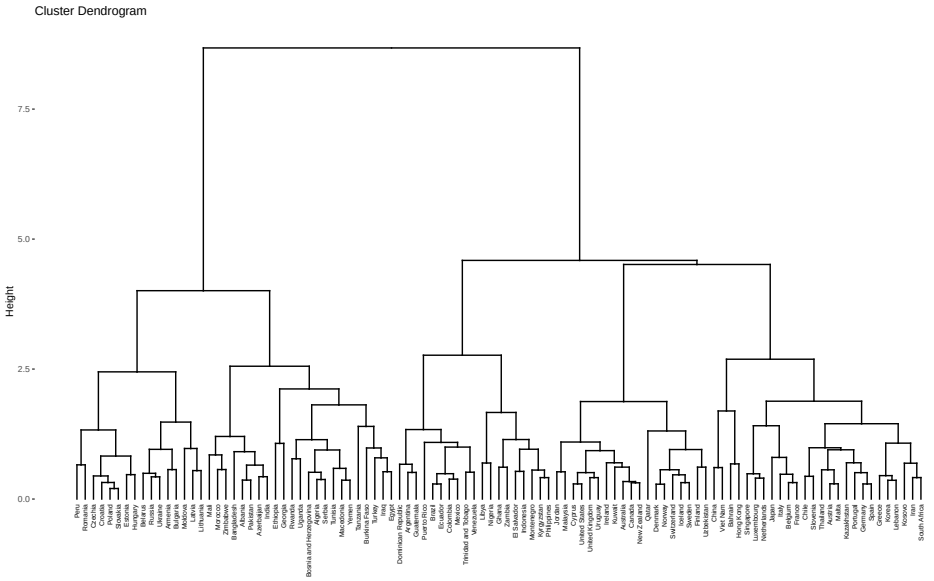

Figure A.1: Dendogram

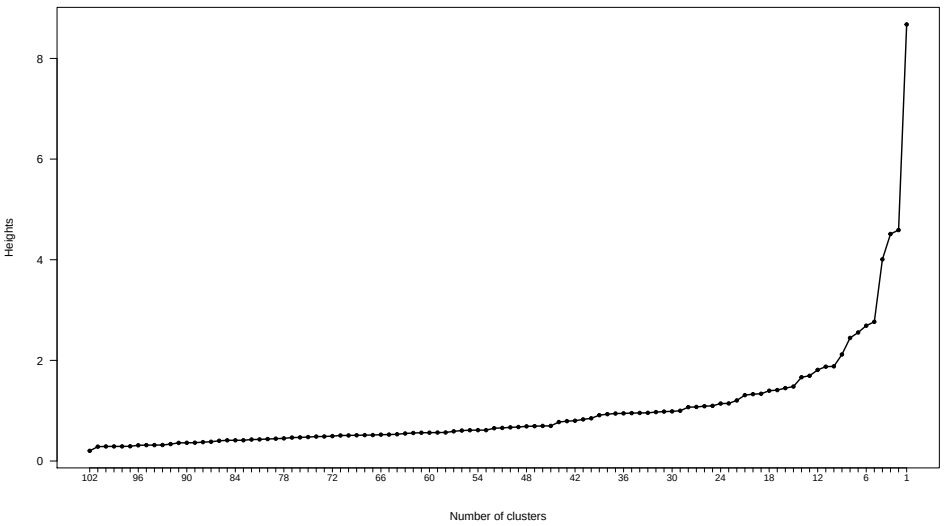

Figure A.2: Scree plot: distances against number of clusters

Appendix B

Chapter 3 supplementary material

B.1 Tables

Table B.1: Data set

Country	*support*	*family*	*friends*	*tolerance*	*generosity*	*collective*
Albania	0.821	0.513	2.029	0.324	-0.014	3.287
Algeria	0.825	0.846	2.223	0.302	-0.21	2.888
Argentina	0.905	-0.151	2.35	0.769	-0.138	2.147
Armenia	0.699	0.362	2.356	0.27	-0.205	2.385
Australia	0.958	-0.503	2.556	0.799	0.314	3.752
Austria	0.935	-1.374[2]	2.339	0.691	0.295	3.478
Azerbaijan	0.74	-0.09	2.226	0.08	-0.15	3.544
Bahrain	0.884	-1.514[1]	2.106	0.823	-0.059	4.163
Bangladesh	0.558	0.468	1.992	0.552	-0.021	3.871
Belarus	0.902	-1.039	2.157	0.323	-0.211	2.975
Belgium	0.926	-0.733[2]	2.366	0.824	0.034	3.172
Bosnia and Herzegovina	0.766	0.321	2.502	0.365	0.005	2.891
Brazil	0.9	0.337	2.291	0.784	-0.079	2.104
Bulgaria	0.832	-0.509	2.244	0.467	-0.14	2.659
Burkina Faso	0.771	1.267[1]	2.46	0.194	-0.052	2.902
Canada	0.962	-0.318	2.536	0.802	0.245	3.822
Chile	0.827	0.197	1.838	0.602	0.136	3.117
China	0.778	-1.134	2.185	0.363	-0.171	4.705
Colombia	0.897	0.474	2.144	0.687	-0.045	2.446
Croatia	0.91	-0.548	2.335	0.496	-0.092	2.719
Cyprus	0.878	0.443[2]	2.44	0.609	0.012	3.327
Czechia	0.909	-1.222	2.136	0.667	-0.065	2.651
Denmark	0.96	-2.257[2]	2.509	0.918	0.251	4.313
Dominican Republic	0.875	0.428	2.24	0.513	-0.022	1.936

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Country	*support*	*family*	*friends*	*tolerance*	*generosity*	*collective*
Ecuador	0.801	1.247[1]	2.032	0.612	-0.194	2.565
Egypt	0.744	1.446	2.274	0.004	-0.123	3.781
El Salvador	0.777	1.125	2.542	0.217	-0.103	2.719
Estonia	0.898	-1.362	2.159	0.459	-0.229	3.024
Ethiopia	0.634	0.591[1]	2.745	0.169	0.016	2.494
Finland	0.958	-2.217	2.483	0.783	0.006	4.157
France	0.94	-0.426	2.413	0.83	0.043	3.28
Georgia	0.56	0.734	2.685	0.152	-0.233	2.683
Germany	0.936	-1.789	2.369	0.791	0.082	3.45
Ghana	0.689	1.0571	2.172	0.209	0.072	3.384
Greece	0.822	-0.452[2]	2.385	0.716	-0.192	2.604
Guatemala	0.832	1.536[1]	2.259	0.845	0.115	1.791
Hong Kong	0.836	-1.468[1]	2.326	0.573	0.248	3.897
Hungary	0.92	-0.857	2.166	0.532	-0.15	3.051
Iceland	0.977	-0.933[2]	2.473	0.906	0.27	4.077
India	0.606	0.101	2.123	0.448	-0.011	3.496
Indonesia	0.771	0.894	2.516	0.378	0.337	3.304
Iran	0.742	0.218	2.075	0.511	0.025	3.686
Iraq	0.788	1.218[1]	2.477	0.197	-0.131	2.898
Ireland	0.975	-0.190[2]	2.592	0.729	0.281	3.948
Italy	0.9	-0.369	2.289	0.704	0.132	3.288
Japan	0.909	-1.294	2.387	0.315	-0.155	3.236
Jordan	0.856	1.261	2.433	0.148	-0.109	4.17
Kazakhstan	0.905	0.456[1]	2.338	0.264	-0.246	3.621
Korea	0.796	-0.51	2.421	0.373	-0.074	3.051
Kosovo	0.884	0.985[2]	1.984	0.381	0.085	3.898
Kyrgyzstan	0.85	0.621	2.28	0.275	-0.094	2.924
Latvia	0.858	-1.843	1.967	0.451	-0.202	2.409
Lebanon	0.708	-0.474[1]	2.349	0.415	-0.001	2.514
Libya	0.855	1.558[1]	2.579	0.235	-0.065	2.591
Lithuania	0.928	-2.162	1.964	0.264	-0.282	2.444
Luxembourg	0.939	-0.871[2]	2.412	0.812	0.122	3.88
Macedonia	0.811	0.416	2.531	0.411	0.081	2.484
Malaysia	0.826	0.869[1]	2.372	0.362	0.037	3.779
Mali	0.761	1.258[1]	2.5	0.336	-0.069	3.742
Malta	0.916	1.258[2]	2.125	0.697	0.458	3.595
Mexico	0.856	0.07	2.027	0.62	-0.093	2.333
Moldova	0.829	-0.192	2.022	0.235	-0.087	2.46
Montenegro	0.832	0.36	2.483	0.315	-0.132	2.879
Morocco	0.833	1.215	2.131	0.107	-0.201	3.085
Netherlands	0.945	-1.852	2.526	0.922	0.331	3.668
New Zealand	0.957	-0.89	2.524	0.814	0.282	3.653

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Country	*support*	*family*	*friends*	*tolerance*	*generosity*	*collective*
Nigeria	0.756	1.313	2.477	0.221	0.083	2.64
Norway	0.947	-1.501	2.618	0.882	0.045	4.464
Pakistan	0.513	1.074	1.948	0.779	0.113	2.877
Palestine	0.761	0.927[1]	2.26	0.347	-0.153	2.834
Peru	0.791	0.342	1.764	0.529	-0.09	1.782
Philippines	0.797	1.152	2.228	0.72	0.036	3.463
Poland	0.924	0.087	2.165	0.44	-0.019	2.907
Portugal	0.896	-0.205[2]	2.184	0.684	-0.2	3.117
Qatar	0.894	1.784[1]	2.711	0.166	0.07	5.335
Romania	0.761	-0.022	1.953	0.394	-0.146	2.387
Russia	0.894	-0.853	2.12	0.33	-0.303	2.468
Rwanda	0.594	0.298[1]	2.589	0.239	-0.006	3.999
Serbia	0.844	-0.173	2.452	0.378	-0.168	2.394
Singapore	0.884	0.392	2.397	0.629	0.029	4.231
Slovakia	0.954	-0.707	2.223	0.53	-0.06	2.783
Slovenia	0.926	-0.531	2.326	0.583	0.004	2.757
South Africa	0.864	0.669	1.967	0.552	-0.143	3.576
Spain	0.948	-0.251	2.36	0.819	-0.13	3.24
Sweden	0.931	-1.627	2.641	0.919	0.153	4.04
Switzerland	0.951	-1.444	2.526	0.878	0.285	3.892
Taiwan	0.846	-0.046	2.295	0.46	-0.005	2.856
Tanzania	0.802	0.552	2.149	0.261	0.102	4.192
Thailand	0.904	0.442[1]	2.15	0.636	0.436	3.128
Trinidad and Tobago	0.869	0.636[1]	2.101	0.435	0.082	2.215
Tunisia	0.648	1.561[1]	2.232	0.311	-0.219	2.369
Turkey	0.75	0.793	2.652	0.105	-0.209	3.556
Uganda	0.841	0.467	2.695	0.239	0.013	3.85
Ukraine	0.853	-0.484	2.233	0.371	-0.217	2.321
United Kingdom	0.967	-0.613	2.534	0.792	0.332	3.583
United States	0.935	-0.222	2.537	0.726	0.203	3.57
Uruguay	0.896	-0.296	2.36	0.808	-0.139	2.993
Uzbekistan	0.924	1.514[1]	2.422	0.35	0.04	5.101
Venezuela	0.929	1.327	2.299	0.375	-0.188	2.225
Viet Nam	0.888	0.545	2.05	0.671	0.018	5.746
Yemen	0.638	1.270[1]	2.402	0.313	-0.173	2.192
Zambia	0.688	0.229[1]	2.357	0.264	-0.077	2.924
Zimbabwe	0.845	1.313	2.149	0.193	-0.064	3.268

[1] *z*-standardized value of *make parents proud+*.
[2] *z*-standardized value of *family ties (AG)*.
Source: Authors.
Data: Helliwell et al. (2019), WVS (2015), and EVS (2015).
Notes: support: Social support, *family*: Family ties, *friends*: Importance friends, *tolerance*: Tolerance of out-groups, *collective*: Collective social capital. See Table 3.6 for the definitions of the variables.

Table B.2: Descriptive statistics of the data set

	Minimum	Maximum	Mean	Std. deviation
Social support	0.513	0.977	0.841	0.101
Family ties	-2.257	1.784	0.042	0.995
Friendship ties	1.764	2.745	2.311	0.209
Tolerance of out-groups	0.004	0.922	0.496	0.24
Generosity	-0.303	0.458	-0.012	0.169
Collective social capital	1.782	5.746	3.209	0.751

Source: Authors.
Data: Helliwell et al. (2019), WVS (2015), and EVS (2015).
Notes: See Table 3.6 for the definitions of the variables.

Table B.3: Agglomeration schedule

	Height	Component 1	Component 2
Cluster 1	0.306	Australia	United Kingdom
Cluster 2	0.433	Belgium	France
Cluster 3	0.453	El Salvador	Iraq
Cluster 4	0.502	New Zealand	Cluster 1
Cluster 5	0.521	Canada	Ireland
Cluster 6	0.575	Burkina Faso	Cluster 3
Cluster 7	0.608	Netherlands	Switzerland
Cluster 8	0.62	Spain	Uruguay
Cluster 9	0.665	Belarus	Estonia
Cluster 10	0.673	Argentina	Brazil
Cluster 11	0.696	Croatia	Slovenia
Cluster 12	0.759	Slovakia	Cluster 11
Cluster 13	0.768	Algeria	Palestine
Cluster 14	0.776	United States	Cluster 5
Cluster 15	0.789	Bulgaria	Ukraine
Cluster 16	0.868	Bosnia and Herzegovina	Macedonia
Cluster 17	0.898	Norway	Sweden
Cluster 18	0.907	Colombia	Mexico
Cluster 19	0.923	Montenegro	Serbia
Cluster 20	0.938	Morocco	Zimbabwe
Cluster 21	0.941	Tunisia	Yemen
Cluster 22	0.955	Hungary	Cluster 9
Cluster 23	0.992	Kyrgyzstan	Cluster 13
Cluster 24	1.006	Taiwan	Poland
Cluster 25	1.055	Iceland	Cluster 4
Cluster 26	1.058	Dominican Republic	Trinidad and Tobago
Cluster 27	1.059	Armenia	Zambia
Cluster 28	1.076	Moldova	Romania
Cluster 29	1.081	Malta	Thailand
Cluster 30	1.093	Bangladesh	India
Cluster 31	1.128	Italy	Cluster 2
Cluster 32	1.133	Germany	Luxembourg
Cluster 33	1.162	Malaysia	Mali
Cluster 34	1.165	Denmark	Cluster 7
Cluster 35	1.185	Latvia	Lithuania
Cluster 36	1.216	Korea	Cluster 19
Cluster 37	1.231	Cyprus	Singapore
Cluster 38	1.237	Libya	Cluster 6
Cluster 39	1.266	Austria	Hong Kong
Cluster 40	1.275	Portugal	Cluster 8
Cluster 41	1.295	Cluster 14	Cluster 25
Cluster 42	1.301	Albania	Iran

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	Height	Component 1	Component 2
Cluster 43	1.36	Russia	Cluster 15
Cluster 44	1.367	Tanzania	Kosovo
Cluster 45	1.415	Czechia	Cluster 12
Cluster 46	1.418	Finland	Cluster 17
Cluster 47	1.421	Nigeria	Cluster 38
Cluster 48	1.513	Lebanon	Cluster 27
Cluster 49	1.518	Jordan	Cluster 33
Cluster 50	1.521	Greece	Cluster 10
Cluster 51	1.562	Japan	Cluster 22
Cluster 52	1.61	Cluster 31	Cluster 32
Cluster 53	1.621	Cluster 18	Cluster 26
Cluster 54	1.631	Azerbaijan	Egypt
Cluster 55	1.637	South Africa	Cluster 42
Cluster 56	1.667	Qatar	Uzbekistan
Cluster 57	1.693	Cluster 20	Cluster 23
Cluster 58	1.698	Ethiopia	Georgia
Cluster 59	1.723	Cluster 24	Cluster 45
Cluster 60	1.773	Turkey	Uganda
Cluster 61	1.801	Philippines	Cluster 37
Cluster 62	1.876	Cluster 16	Cluster 36
Cluster 63	1.899	Ghana	Cluster 54
Cluster 64	1.969	Peru	Cluster 28
Cluster 65	1.988	Kazakhstan	Cluster 57
Cluster 66	1.995	Chile	Cluster 55
Cluster 67	2	Cluster 43	Cluster 51
Cluster 68	2.082	Cluster 40	Cluster 50
Cluster 69	2.1	Ecuador	Venezuela
Cluster 70	2.167	Cluster 49	Cluster 60
Cluster 71	2.28	Cluster 44	Cluster 66
Cluster 72	2.308	Cluster 53	Cluster 69
Cluster 73	2.431	Cluster 34	Cluster 46
Cluster 74	2.438	Pakistan	Cluster 30
Cluster 75	2.449	Bahrain	China
Cluster 76	2.45	Rwanda	Cluster 58
Cluster 77	2.51	Cluster 48	Cluster 62
Cluster 78	2.606	Cluster 39	Cluster 52
Cluster 79	2.781	Guatemala	Cluster 72
Cluster 80	3.018	Cluster 35	Cluster 67
Cluster 81	3.05	Cluster 63	Cluster 65
Cluster 82	3.06	Indonesia	Cluster 29
Cluster 83	3.123	Cluster 59	Cluster 68
Cluster 84	3.23	Viet Nam	Cluster 75

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(continuation)

	Height	Component 1	Component 2
Cluster 85	3.335	Cluster 47	Cluster 70
Cluster 86	3.708	Cluster 64	Cluster 79
Cluster 87	3.72	Cluster 21	Cluster 76
Cluster 88	3.745	Cluster 41	Cluster 78
Cluster 89	3.835	Cluster 61	Cluster 71
Cluster 90	4.085	Cluster 73	Cluster 88
Cluster 91	4.486	Cluster 77	Cluster 85
Cluster 92	4.695	Cluster 84	Cluster 89
Cluster 93	4.757	Cluster 81	Cluster 91
Cluster 94	5.273	Cluster 80	Cluster 83
Cluster 95	5.575	Cluster 87	Cluster 93
Cluster 96	5.947	Cluster 82	Cluster 92
Cluster 97	6.213	Cluster 56	Cluster 96
Cluster 98	6.447	Cluster 86	Cluster 94
Cluster 99	7.067	Cluster 74	Cluster 97
Cluster 100	11.299	Cluster 95	Cluster 99
Cluster 101	12.938	Cluster 98	Cluster 100
Cluster 102	18.17	Cluster 90	Cluster 101

Source: Authors.
Data: Helliwell et al. (2019), WVS (2015), and EVS (2015).

Table B.4: Variance Ratio Criterion (VRC)

# clusters	VR_k	w_k
2	37.307	—
3	34.245	3.273
4	34.457	-4.53
5	30.139	1.589
6	27.41	1.105
7	25.786	0.603
8	24.764	0.262
9	24.006	0.199
10	23.446	—

Source: Authors.
Data: Helliwell et al. (2019), WVS (2015), and EVS (2015).
Notes: VRC implies choosing the cluster with minimum w. See Mooi and Sarstedt (2011, appendix of chap. 9) for a practical explanation of this criterion.

Table B.5: ANOVA output of the social context clusters

		Sum of squares	Df.	Mean Square	F value	Pr(>F)
Social support	Between	0.47	3	0.16	26.97	<0.01
	Within	0.58	99	0.01		
Family ties	Between	48.92	3	16.31	30.98	<0.01
	Within	52.11	99	0.53		
Friendship ties	Between	1.82	3	0.61	22.85	<0.01
	Within	2.63	99	0.03		
Tolerance of out-groups	Between	3.9	3	1.3	64.77	<0.01
	Within	1.98	99	0.02		
Generosity	Between	1.58	3	0.53	39.56	<0.01
	Within	1.32	99	0.01		
Collective social capital	Between	29.56	3	9.85	34.91	<0.01
	Within	27.95	99	0.28		

Source: Authors.
Data: Helliwell et al. (2019), WVS (2015), and EVS (2015).
Notes: See Table 3.6 for definitions of the variables.

Table B.6: Cluster membership

Cluster 1 (n = 20)	Cluster 2 (n = 31)	Cluster 3 (n = 32)	Cluster 4 (n = 20)
Australia	Argentina	Algeria	Albania
Austria	Brazil	Azerbaijan	Bahrain
Belgium	Bulgaria	Armenia	Bangladesh
Canada	Belarus	Bosnia and Herzegovina	Chile
Denmark	Taiwan	El Salvador	China
Finland	Colombia	Ethiopia	Cyprus
France	Croatia	Georgia	India
Germany	Czechia	Palestine	Indonesia
Hong Kong	Dominican Republic	Ghana	Iran
Iceland	Ecuador	Iraq	Malta
Ireland	Estonia	Kazakhstan	Pakistan
Italy	Greece	Jordan	Philippines
Luxembourg	Guatemala	Korea	Qatar
Netherlands	Hungary	Kyrgyzstan	Singapore
New Zealand	Japan	Lebanon	Viet Nam
Norway	Latvia	Libya	South Africa
Sweden	Lithuania	Malaysia	Thailand
Switzerland	Mexico	Mali	Tanzania
United Kingdom	Moldova	Montenegro	Uzbekistan
United States	Peru	Morocco	Kosovo
	Poland	Nigeria	
	Portugal	Rwanda	
	Romania	Serbia	
	Russia	Zimbabwe	
	Slovakia	Tunisia	
	Slovenia	Turkey	
	Spain	Uganda	
	Trinidad and Tobago	Macedonia	
	Ukraine	Egypt	
	Uruguay	Burkina Faso	
	Venezuela	Yemen	
		Zambia	

Source: Authors.

Table B.7: Changing countries: cluster by clustering method

Country	Hierarchical	K-means	K-medoid
Serbia	3	2	2
Algeria	3	3	2
Korea	3	3	2
Lebanon	3	3	2
Ghana	3	3	4
Kazakhstan	3	4	2
Jordan	3	4	3
Malaysia	3	4	3
Uganda	3	4	3
Malta	4	1	1
Thailand	4	1	1
Bahrain	4	1	4
Albania	4	2	4
Chile	4	2	4
South Africa	4	2	4
Bangladesh	4	3	4
India	4	3	4
Pakistan	4	3	4
Cyprus	4	4	2
Indonesia	4	4	3
Qatar	4	4	3
Uzbekistan	4	4	3
Changes		14	12

Source: Authors.

Table B.8: ANOVA output of the social context clusters

		Sum of squares	Df.	Mean Square	F value	Pr(>F)
Social support	Between	0.46	3	0.15	45.53	<0.01
	Within	0.26	77	0		
Family ties	Between	43.63	3	14.54	28.63	<0.01
	Within	39.12	77	0.51		
Friendship ties	Between	1.57	3	0.52	24.68	<0.01
	Within	1.63	77	0.02		
Tolerance of out-groups	Between	3.54	3	1.18	62.64	<0.01
	Within	1.45	77	0.02		
Generosity	Between	1.4	3	0.47	48.24	<0.01
	Within	0.74	77	0.01		
Collective social capital	Between	27.89	3	9.3	45.11	<0.01
	Within	15.87	77	0.21		

Source: Authors.
Data: Helliwell et al. (2019), WVS (2015), and EVS (2015).
Notes: See Table 3.6 for definitions of the variables.

B.2 Figures

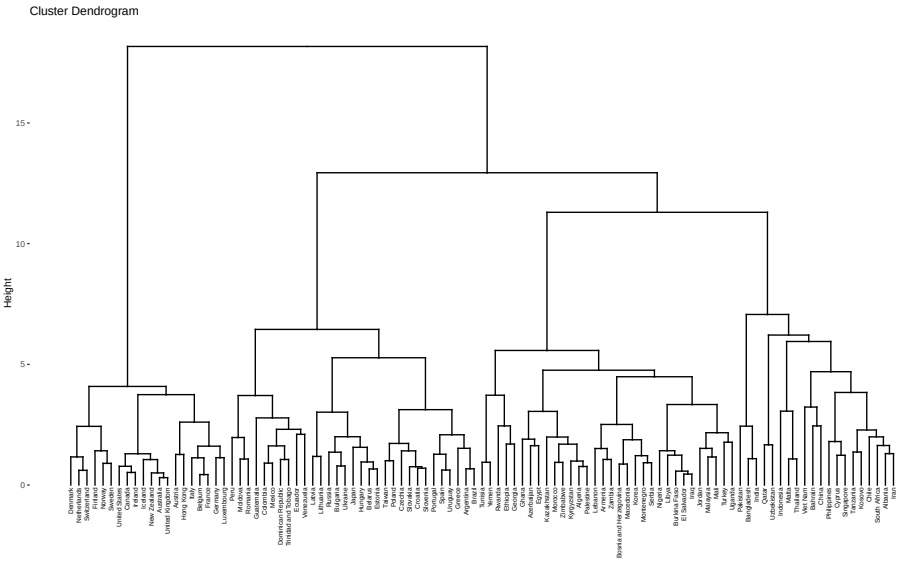

Figure B.1: Dendogram

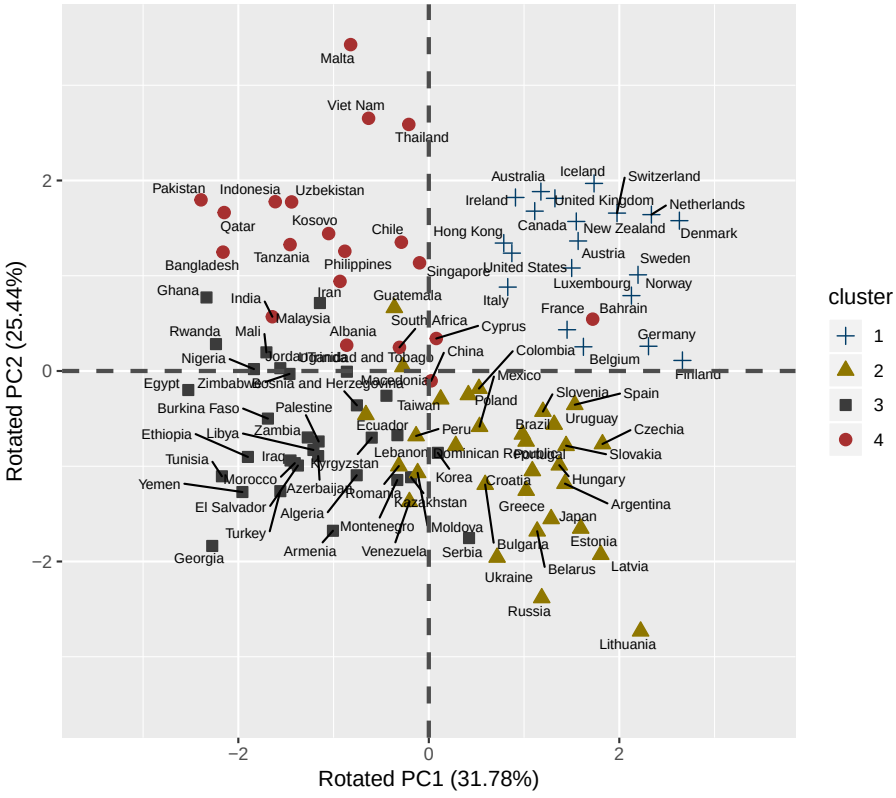

Figure B.2: Biplot with country labels

Appendix C

Chapter 4 supplementary material

C.1 Tables

Table C.1: Sample: country-wave observations

Country / Region	1989-1993		1994-98	1999-04	2005-2010		2010-14	N
	WVS	EVS	WVS	WVS	WVS	EVS	WVS	
Western Europe								**58**
Austria		1990				2008		2
Belgium		1990				2009		2
Cyprus					2006	2008	2011	3
Denmark		1990				2008		2
Finland		1990	1996		2005	2009		4
France		1990			2006	2008		3
Germany		1990	1997		2006	2008/09	2013	5
Greece						2008		1
Iceland						2009/10		1
Ireland		1990				2008		2
Italy		1990			2005	2009		3
Luxembourg						2008		1
Malta						2008		1
Netherlands		1990			2006	2008	2012	4
Norway		1990	1996		2007	2008		4
Portugal		1990				2008		2
Spain	1990	1990	1995	2000	2007	2008	2011	7
Sweden		1990	1996		2006	2009/10	2011	5
Switzerland			1996		2007	2008		3
United Kingdom		1990			2005	2009/10		3
Central and Eastern Europe								**51**
Albania			1998	2002		2008		3

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Country / Region	1989-1993		1994-98	1999-04	2005-2010		2010-14	N
	WVS	EVS	WVS	WVS	WVS	EVS	WVS	
Bosnia and Herzegovina				2001		2008		2
Bulgaria		1991	1997		2005	2008		4
Croatia			1996			2008		2
Czechia	1991	1991	1998			2008		4
Estonia			1996			2008	2011	3
Hungary		1991	1998		2009	2008/09		4
Kosovo						2008		1
Latvia			1996			2008		2
Lithuania			1997			2008		2
Macedonia			1998	2001		2008		3
Montenegro				1996		2008		2
Poland		1990			2005	2008	2012	4
Romania		1993	1998		2005	2008	2012	5
Serbia			1996	2001	2005	2008		4
Slovakia			1998			2008		2
Slovenia			1995		2005	2008	2011	4
Community of Independent States								**29**
Armenia			1997			2008	2011	3
Azerbaijan			1997				2011	2
Belarus			1996			2008	2011	3
Georgia			1996		2009	2008	2014	4
Kazakhstan							2011	1
Kyrgyzstan				2003			2011	2
Moldova			1996	2002	2006	2008		4
Russia	1990		1995		2006	2008	2011	5
Ukraine			1996		2006	2008	2011	4
Uzbekistan							2011	1
South Asia								**9**
Bangladesh			1996	2002				2
India	1990		1995	2001	2006		2014	5
Pakistan				2001			2012	2
Southeast Asia								**12**
Indonesia				2001	2006			2
Malaysia					2006		2012	2
Philippines			1996	2001			2012	3
Singapore							2012	1
Thailand					2007		2013	2
Viet Nam				2001	2006			2
East Asia								**13**
China	1990				2007		2012	3
Hong Kong					2005		2013	2

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(continuation)

Country / Region	1989-1993		1994-98	1999-04	2005-2010		2010-14	N
	WVS	EVS	WVS	WVS	WVS	EVS	WVS	
Japan	1990		1995	2000	2005		2010	5
Korea				2001	2005		2010	3
Latin America and the Caribbean								**35**
Argentina	1991		1995	1999	2006		2013	5
Brazil	1991				2006		2014	3
Chile	1990		1996	2000	2006		2011	5
Colombia			1998				2012	2
Dominican Republic			1996					1
Ecuador							2013	1
El Salvador			1999					1
Guatemala					2004			1
Mexico	1990			2000	2005		2012	4
Peru			1996	2001	2006		2012	4
Puerto Rico			1995	2001				2
Trinidad and Tobago					2006		2011	2
Uruguay			1996		2006		2011	3
Venezuela			1996					1
North America, Australia, and New Zealand								**14**
Australia			1995		2005		2012	3
Canada	1990			2000	2006			3
New Zealand			1998		2004		2011	3
United States		1990	1995	1999	2006		2011	5
Middle East and North Africa								**21**
Algeria				2002			2013	2
Bahrain							2014	1
Egypt				2001			2013	2
Iran				2000	2007			2
Iraq							2012	1
Jordan				2001			2014	2
Lebanon							2013	1
Libya							2014	1
Morocco				2001	2007			2
Tunisia							2013	1
Turkey			1996	2001	2007	2008/09	2011	5
Yemen							2014	1
Subsaharan Africa								**19**
Burkina Faso					2007			1
Ethiopia					2007			1
Ghana					2007		2012	2
Mali					2007			1
Nigeria	1990		1995	2000			2011	4

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Country / Region	1989-1993		1994-98	1999-04	2005-2010		2010-14	N
	WVS	EVS	WVS	WVS	WVS	EVS	WVS	
Rwanda					2007		2012	2
South Africa			1996	2001			2013	3
Tanzania				2001				1
Uganda				2001				1
Zambia					2007			1
Zimbabwe				2001			2012	2
TOTAL								**261**

Source: Authors based on WVS (2015), EVS (2015), and EVS and GESIS (2015).

Table C.2: Descriptive statistics of the data set

Variable	Range of values	Min.	Max.	Mean	Std. deviation
Life satisfaction	1-10	3.725	8.512	6.693	0.997
Overall happiness	1-4	1.872	3.613	3.054	0.27
Blessed	0-1	0.038	1	0.679	0.219
Attend	1-6	1.059	5.67	3.039	0.961
Religious	0-1	0.049	0.997	0.688	0.203
God	1-10	1.624	10	7.179	1.948
Chfaith	0-1	0.012	1	0.349	0.24
Hell	0-1	0.077	1	0.499	0.268
GDP per capita		857	94900.35	20109.66	15444.44
Health	1-4	2.018	3.475	2.794	0.288
Social support	2-8	6.432	7.752	7.178	0.268
Collective social capital	3-10	4.581	8.871	6.14	0.75
Freedom	1-10	4.435	8.442	6.827	0.742

Source: Authors.
Data: WVS (2015), EVS (2015) and World Bank (2018).
Notes: See Section 4.3.1 for the definitions of the variables.

Table C.3: Regressions to explain average life satisfaction across countries controlling for membership

Independent variables	Model 0	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Religiosity									
Attend		0.069	0.248					0.126	0.179
		(0.067)	(0.083)***					(0.093)	(0.092)*
Religious				0.01	0.479			-0.245	0.001
				(0.313)	(0.325)			(0.378)	(0.363)
God						0.008	0.098	-0.019	0.053
						(0.035)	(0.046)**	(0.043)	(0.048)
Religious introjection									
Chfaith			-1.183		-0.716		-0.999		-1.191
			(0.327)***		(0.303)**		(0.365)***		(0.380)***
Controls									
Log GDP per capita	0.164	0.178	0.173	0.154	0.148	0.156	0.157	0.163	0.17
	(0.071)**	(0.071)**	(0.070)**	(0.068)**	(0.069)**	(0.068)**	(0.069)**	(0.068)**	(0.069)**
Health	0.38	0.314	0.288	0.223	0.32	0.21	0.214	0.144	0.15
	(0.243)	(0.261)	(0.241)	(0.222)	(0.223)	(0.239)	(0.231)	(0.258)	(0.252)
Social support	0.275	0.292	0.346	0.386	0.351	0.387	0.381	0.427	0.417
	(0.252)	(0.259)	(0.221)	(0.241)	(0.220)	(0.244)	(0.220)*	(0.245)*	(0.221)*
Collective social capital	0.244	0.267	0.209	0.247	0.212	0.25	0.196	0.259	0.214
	(0.060)***	(0.067)***	(0.068)***	(0.063)***	(0.064)***	(0.060)***	(0.062)***	(0.067)***	(0.067)***
Freedom	0.716	0.72	0.758	0.717	0.717	0.715	0.709	0.74	0.738
	(0.084)***	(0.085)***	(0.074)***	(0.080)***	(0.078)***	(0.080)***	(0.077)***	(0.079)***	(0.075)***
Membership	-0.044	-0.046	-0.068	-0.055	-0.062	-0.053	-0.048	-0.062	-0.064
	(0.046)	(0.046)	(0.045)	(0.044)	(0.044)	(0.043)	(0.043)	(0.044)	(0.044)
Number of countries	82	82	82	81	81	81	81	81	81
Number of observations	139	139	139	138	138	138	138	138	138
Adjusted R-squared	0.819	0.819	0.837	0.825	0.831	0.825	0.835	0.824	0.838

Source: Authors. *Data:* WVS (2015), EVS (2015) and World Bank (2018). *Notes:* See notes in Table 4.3. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively.

Table C.4: Regressions to explain average life satisfaction across countries controlling for altruism (*charity*)

Independent variables	Model 0	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Religiosity									
Attend		0.05	0.162					0.098	0.102
		(0.064	(0.073)**					(0.083)	(0.083)
Religious				-0.024	0.414			-0.232	0.009
				(0.31)	(0.325)			(0.378)	(0.368)
God						0.003	0.087	-0.016	0.053
						(0.036)	(0.046)*	(0.042)	(0.047)
Religious introjection									
Chfaith			-0.935		-0.693		-0.936		-0.979
			(0.282)***		(0.289)**		(0.337)***		(0.348)***
Controls									
Log GDP per capita	0.18	0.188	0.167	0.172	0.157	0.174	0.168	0.176	0.17
	(0.072)**	(0.073)**	(0.071)**	(0.070)**	(0.069)**	(0.070)**	(0.070)**	(0.070)**	(0.070)**
Health	0.567	0.533	0.558	0.43	0.526	0.426	0.45	0.383	0.429
	(0.234)**	(0.251)**	(0.247)**	(0.221)*	(0.220)**	(0.234)*	(0.233)*	(0.254)	(0.258)*
Social support	0.284	0.309	0.4	0.378	0.385	0.378	0.407	0.427	0.453
	(0.232)	(0.24)	(0.217)*	(0.221)*	(0.201)*	(0.223)*	(0.201)**	(0.226)*	(0.206)**
Collective social capital	0.236	0.248	0.179	0.235	0.195	0.239	0.178	0.237	0.184
	(0.061)***	(0.065)***	(0.065)***	(0.064)***	(0.065)***	(0.063)***	(0.062)***	(0.066)***	(0.065)***
Freedom	0.684	0.687	0.72	0.686	0.69	0.684	0.68	0.706	0.699
	(0.085)***	(0.086)***	(0.080)***	(0.081)***	(0.079)***	(0.082)***	(0.078)***	(0.083)***	(0.081)***
Charity	-0.349	-0.359	-0.453	-0.419	-0.46	-0.414	-0.362	-0.46	-0.43
	(0.353)	(0.351)	(0.336)	(0.341)	(0.337)	(0.339)	(0.327)	(0.336)	(0.326)
Number of countries	86	86	86	85	85	85	85	85	85
Number of observations	149	149	149	148	148	148	148	148	148
Adjusted R-squared	0.822	0.822	0.835	0.827	0.833	0.827	0.836	0.826	0.836

Source: Authors. *Data:* WVS (2015), EVS (2015) and World Bank (2018). *Notes:* See notes in Table 4.3. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively.

Table C.5: Regressions to explain average life satisfaction across countries controlling for altruism (*generosity GWP*)

Independent variables	Model 0	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Religiosity									
Attend		-0.027	0.138					-0.034	0.005
		(0.064)	(0.072)*					(0.097)	(0.095)
Religious				0.095	0.648			0.296	0.491
				(0.259)	(0.271)**			(0.258)	(0.273)*
God						-0.015	0.079	-0.023	0.053
						(0.025)	(0.030)**	(0.036)	(0.037)
Religious introjection									
Chfaith			-1.06		-0.993		-1.109		-1.206
			(0.217)***		(0.194)***		(0.227)***		(0.239)***
Controls									
Log GDP per capita	0.151	0.144	0.118	0.142	0.139	0.121	0.121	0.138	0.149
	(0.069)**	(0.074)*	(0.065)*	(0.074)*	(0.064)**	(0.069)*	(0.064)*	(0.072)*	(0.062)**
Health	0.516	0.532	0.542	0.358	0.488	0.373	0.416	0.403	0.456
	(0.252)**	(0.255)**	(0.226)**	(0.23)	(0.207)**	(0.229)	(0.214)*	(0.229)*	(0.214)**
Social support	-0.018	-0.022	0.23	0.078	0.235	0.086	0.296	0.061	0.284
	(0.217)	(0.216)	(0.177)	(0.21)	(0.177)	(0.207)	(0.178)	(0.209)	(0.18)
Collective social capital	0.228	0.216	0.165	0.232	0.165	0.214	0.152	0.219	0.165
	(0.062)***	(0.073)***	(0.073)**	(0.064)***	(0.063)**	(0.063)***	(0.060)**	(0.072)***	(0.068)**
Freedom	0.549	0.551	0.539	0.536	0.519	0.544	0.511	0.54	0.505
	(0.081)***	(0.082)***	(0.076)***	(0.078)***	(0.071)***	(0.079)***	(0.073)***	(0.075)***	(0.068)***
Generosity GWP	0.469	0.496	0.565	0.512	0.709	0.534	0.655	0.569	0.689
	(0.217)**	(0.232)**	(0.214)**	(0.206)**	(0.181)***	(0.202)***	(0.194)***	(0.219)**	(0.207)**
Number of countries	86	86	86	85	85	85	85	85	85
Number of observations	128	128	128	127	127	127	127	127	127
Adjusted R-squared	0.782	0.78	0.809	0.78	0.81	0.781	0.808	0.778	0.81

Source: Authors. *Data:* Helliwell et al. (2019), WVS (2015), EVS (2015) and World Bank (2018). *Notes:* See notes in Table 4.3. Data from Helliwell et al. (2019) does not always correspond with the same year of the IVS observations; we use data from Helliwell et al. (2019) that is not exactly from the same year when it fulfils two conditions: the data was collected in a very close year and the values of the variables are very stable along several years around the year of interest. Table C.8 shows how the matching was done. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively.

Table C.6: Regressions to explain average life satisfaction across countries controlling for social support (GWP)

Independent variables	Model 0	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Religiosity									
Attend		0.004	0.109					-0.071	-0.038
		(0.058)	(0.067)					(0.104)	(0.100)
Religious				0.18	0.522			0.224	0.385
				(0.231)	(0.261)**			(0.250)	(0.256)
God						0.016	0.079	0.028	0.073
						(0.027)	(0.028)***	(0.047)	(0.042)*
Religious introjection									
Chfaith			-0.706		-0.63		-0.78		-0.842
			(0.204)***		(0.176)***		(0.168)***		(0.187)***
Controls									
Log GDP per capita	0.069	0.07	0.067	0.072	0.081	0.064	0.071	0.075	0.092
	(0.063)	(0.068)	(0.065)	(0.068)	(0.065)	(0.063)	(0.058)	(0.066)	(0.062)
Health	0.543	0.54	0.648	0.446	0.616	0.428	0.556	0.456	0.596
	(0.199)***	(0.210)**	(0.201)***	(0.192)**	(0.189)***	(0.195)**	(0.189)***	(0.198)**	(0.192)***
Social support GWP	2.287	2.29	1.784	2.258	1.872	2.274	1.965	2.36	1.997
	(0.517)***	(0.522)***	(0.500)***	(0.527)***	(0.521)***	(0.574)***	(0.542)***	(0.607)***	(0.561)***
Collective social capital	0.159	0.16	0.135	0.171	0.137	0.166	0.127	0.161	0.131
	(0.062)**	(0.074)**	(0.073)*	(0.064)***	(0.062)**	(0.061)***	(0.059)**	(0.071)**	(0.069)*
Freedom	0.56	0.559	0.561	0.55	0.546	0.551	0.539	0.544	0.531
	(0.078)***	(0.079)***	(0.077)***	(0.076)***	(0.073)***	(0.077)***	(0.073)***	(0.073)***	(0.069)***
Number of countries	86	86	86	85	85	85	85	85	85
Number of observations	134	134	134	133	133	133	133	133	133
Adjusted R-squared	0.8	0.798	0.809	0.795	0.806	0.795	0.808	0.793	0.808

Source: Authors. *Data:* Helliwell et al. (2019), WVS (2015), EVS (2015) and World Bank (2018). *Notes:* See notes in Table 4.3. Data from Helliwell et al. (2019) does not always correspond with the same year of the IVS observations; we use data from Helliwell et al. (2019) that is not exactly from the same year when it fulfils two conditions: the data was collected in a very close year and the values of the variables are very stable along several years around the year of interest. Table C.8 shows how the matching was done. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively.

Table C.7: Regressions to explain average life satisfaction across countries controlling for corruption (GWP)

Independent variables	Model 0	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Religiosity									
Attend		-0.06	0.134					-0.057	0.01
		(0.078)	(0.084)					(0.106)	(0.105)
Religious				-0.065	0.539			0.219	0.395
				(0.29)	(0.281)*			(0.301)	(0.299)
God						-0.033	0.069	-0.03	0.044
						(0.033)	(0.036)*	(0.041)	(0.038)
Religious introjection									
Chfaith			-1.16		-1.1		-1.168		-1.256
			(0.256)***		(0.212)***		(0.248)***		(0.265)***
Controls									
Log GDP per capita	0.083	0.074	0.051	0.062	0.073	0.045	0.065	0.059	0.084
	(0.082)	(0.083)	(0.071)	(0.09)	(0.075)	(0.081)	(0.07)	(0.085)	(0.073)
Health	0.77	0.814	0.771	0.618	0.769	0.656	0.674	0.707	0.724
	(0.266)***	(0.272)***	(0.235)***	(0.247)**	(0.223)***	(0.251)**	(0.222)***	(0.253)***	(0.232)***
Social support	-0.182	-0.158	0.168	-0.066	0.205	-0.04	0.237	-0.054	0.227
	(0.231)	(0.22)	(0.192)	(0.212)	(0.187)	(0.211)	(0.189)	(0.209)	(0.19)
Corruption GWP	-0.695	-0.6	-0.353	-0.619	-0.292	-0.528	-0.324	-0.515	-0.338
	(0.200)***	(0.206)***	(0.192)*	(0.191)***	(0.192)	(0.208)**	(0.192)*	(0.210)**	(0.193)*
Freedom	0.526	0.526	0.543	0.524	0.524	0.535	0.51	0.524	0.504
	(0.093)***	(0.092)***	(0.078)***	(0.093)***	(0.093)***	(0.090)***	(0.081)***	(0.087)***	(0.076)***
Number of countries	82	82	82	81	81	81	81	81	81
Number of observations	128	128	128	127	127	127	127	127	127
Adjusted R-squared	0.757	0.756	0.788	0.748	0.783	0.75	0.782	0.746	0.781

Source: Authors. *Data:* Helliwell et al. (2019), WVS (2015), EVS (2015) and World Bank (2018). *Notes:* See notes in Table 4.3. Data from Helliwell et al. (2019) does not always correspond with the same year of the IVS observations; we use data from Helliwell et al. (2019) that is not exactly from the same year when it fulfils two conditions: the data was collected in a very close year and the values of the variables are very stable along several years around the year of interest. Table C.8 shows how the matching was done. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively.

Table C.8: Matching between IVS data and Helliwell et al.'s (2019) data

Country	Year		Variables
	WVS	Gallup	
Albania	2008	2007	data on: social support, generosity, corruption
Algeria	2013	2012	data on: social support, generosity, corruption
Australia	2005	2007	data on: generosity
Belgium	2009	2008	data on: social support, generosity, corruption
Bosnia and Herzegovina	2008	2007	data on: social support, generosity, corruption
Brazil	2006	2007	data on: social support, generosity, corruption
Bulgaria	2008	2007	data on: social support, generosity, corruption
Canada	2006	2005	data on: social support, generosity, corruption
Colombia	2005	2006	data on: social support, generosity, corruption
Croatia	2008	2007	data on: social support, generosity, corruption
Cyprus	2008	2009	data on: social support, generosity, corruption
Czechia	2008	2007	data on: social support, generosity, corruption
Finland	2005	2006	data on: social support, generosity, corruption
Finland	2009	2008	data on: social support, generosity, corruption
Germany	2008	2007	data on: social support, generosity, corruption
Greece	2008	2007	data on: social support, generosity, corruption
Hong Kong	2005	2006	data on: social support, generosity, corruption
Hong Kong	2013	2012	data on: social support, generosity, corruption
Hungary	2008	2007	data on: social support, generosity, corruption
India	2006	2007	data on: generosity
Korea	2005	2006	data on: social support, generosity, corruption
Kuwait	2014	2013	data on: social support
Libya	2014	2015	data on: social support, generosity
Luxembourg	2008	2009	data on: social support, generosity, corruption
Macedonia	2008	2007	data on: social support, generosity, corruption
Mali	2007	2006	data on: social support, generosity, corruption
Malta	2008	2009	data on: social support, generosity,
Montenegro	2008	2007	data on: social support, generosity, corruption
Netherlands	2006	2007	data on: social support, generosity, corruption
Nigeria	2011	2010	data on: social support, generosity, corruption
Norway	2007	2006	data on: social support, generosity, corruption
Poland	2008	2007	data on: social support, generosity, corruption
Romania	2008	2007	data on: social support, generosity, corruption
Serbia	2008	2007	data on: social support, generosity, corruption
Slovenia	2005	2006	data on: social support, generosity, corruption
South Africa	2006	2007	data on: corruption
Switzerland	2007	2006	data on: social support, generosity, corruption
Switzerland	2008	2009	data on: social support, generosity, corruption
United Kingdom	2005	2007	data on: generosity
United States	2006	2007	data on: generosity
Viet Nam	2006	2007	data on: corruption

Source: Authors.

Table C.9: Changes in main religious variables

	attend	*god*	*chfaith*
Number of observations	125	125	125
Significant increases	33	40	35
	(26%)	(32%)	(28%)
Significant decreases	53	38	38
	(42%)	(30%)	(30%)
No significant change	39	47	52
	(32%)	(38%)	(42%)

Source: Authors.
Data: WVS (2015) and EVS (2015).
Notes: Observations represent absolute changes in the value of the corresponding variable between two consecutive rounds of the survey. Significant increases/decreases refer to the number (proportion) of observations that represent a significant increase/decrease (at the 5% level). The number (proportion) of significant increases, significant decreases, and non-significant changes add up to the total number (100%) of observations.