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The impact of mega-sport events on host residents' quality of life

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LIST OF ABBREVIATIONS

CFA	Confirmatory factor analysis
FIFA	Fédération Internationale de Football Association
SPSS	Statistical Package for the Social Sciences
UEFA	Union des Associations Européennes de Football
WHO	World Health Organization
WHOQOL-BREF	World Health Organization Quality of Life-BREF

SUMMARY

This thesis is devoted to an important, but previously under-researched topic: the impact of hosting a mega-sport event on residents' health outcomes. Sport events are per definition mega-sport events if they attract a large international audience. Even though these events are always hosted for a limited time over a short period, they entail significant financial cost. For this reason, mostly tangible outcomes such as economic impacts of event hosting are investigated. The authors of a systematic review concluded that in the majority of the few studies, which focus on intangible outcomes from mega-sport events such as the health impact, the quality of the research is poor. This research focuses on short-term impacts of hosting an event, assuming that emotions caused by hosting an event can impact residents' short-term health outcomes, e.g., being proud of the national team and of the event hosting, or feeling that the city is important due to the media attention and a growing number of international visitors. These effects are considered to be short-term and, thus, they may not be considered as "legacies" of mega-sport events, the latter meaning that these effects are long-lasting (i.e., remaining for years after event hosting).

The aim of this thesis is to investigate the change in residents' health outcomes over the course of the 2014 FIFA World Cup as a short-term impact of the event hosting, and the development three months after the event. Particularly, the thesis addresses the following research questions: *Do residents in a host city of a mega-sport event experience a change in their short-term health outcomes per se? Do contextual factors matter in the change of residents' quality of life?*

SUMMARY

The questions are approached using three theories: First, Social Identity Theory is used to explain the processes of inter-individual interactions with like-minded individuals (i.e., fans) during event hosting. The next theory is Nation Building Theory, which provides the basis to explain what happens to individuals when interacting with others on a national level (Tilly, 1990). Lastly, Mehrabian and Russell's (1974) environmental psychology behavioral model is used to explain the possible changes in quality of life impacted by the perceived event atmosphere.

The data were collected from residents of Rio de Janeiro over three waves: at the beginning of the 2014 FIFA World Cup (T1), at the end of the event (T2), and three months after the end of the event (T3). The dependent variable, individuals' health outcomes, was operationalized as the subjective evaluation of an individual's health status, using the twenty-four item scale WHOQOL-BREF (WHOQOL Group, 1998).   The scale measures quality of life, as a multidimensional construct, on four dimensions: physical, social, psychological and environmental quality of life. The questionnaire was distributed in Brazilian Portuguese and scales were translated, when necessary.

To answer the research questions and to enhance theoretical and practical knowledge, results are presented in two empirical parts. The results of the first data analysis consist of longitudinal data analyses that examine the change in quality of life over the course of the event. The data are analyzed applying piecewise growth modeling in Mplus. In the second data analysis, data are analyzed via mediated regression analyses, to gain further insights into the mechanism behind team identification, national identity and its effect on the four

quality of life domains. These analyses are performed using the PROCESS macro in SPSS.

As predicted, the results revealed that there is no change in quality of life per se. A next step in the analysis was to analyze the effect of two contextual factors, which are perceived atmosphere and team identification. There was a significant effect of perceived atmosphere on the change in the four quality of life dimensions during the event, meaning the higher an individual perceived the atmosphere, the higher the change in quality of life from the beginning to the end of the event. The effect of team identification on quality of life was only significant at the end of the event, while it was non-significant for the change in quality of life from T1 to T2 and from T2 to T3. To analyze, which factor had the greater impact on the construct and the change in quality of life, piecewise growth models were measured, including the two factors simultaneously. The results showed that the effect of perceived atmosphere on the change of quality of life remained significant, while the effect of team identification on the construct vanished. The second aim was to further investigate team identification and to explain the mechanism behind team identification on quality of life. Therefore, the mediated regression analysis was conducted to test if the effect of team identification on quality of life is mediated via national identity. The indirect effect of team identification on quality of life was significant for the four quality of life domains. Thus, being identified with the national team increased national identity, which in turn resulted in positive quality of life outcomes in all domains. The contextual factor perceived atmosphere had an impact on the change in quality of life from the beginning to the end of the event, while the effect for team

identification on the construct of quality of life was only significant when mediated by national identity.

This is the first research that used a longitudinal study design and growth modeling to analyze the health impact of hosting a mega-sport event with the same individuals. This thesis uses a multidimensional health approach by collecting data via the WHOQOL-BREF, covering four dimensions of quality of life based on the WHO's holistic approach on health. To ensure consistency and comparability of impact studies, and to have a holistic assessment of the health impact, the use of this scale should be considered in future impact studies.

Data were only collected in one of the 12 host cities, and the sample was well-educated, therefore generalizability of the results may be limited. Future studies may try to reach less-educated population groups (e.g., people residing in favelas), as well as non-host cites. Further limitations and theoretical implications as well as and managerial implications for event organizers, sports foundations, health practitioners and the local tourism industry are formulated at the end of this thesis.

1 INTRODUCTION

The unique and energetic atmosphere that originated from hosting the Fédération Internationale de Football Association (FIFA) World Cup 2006 in Germany quickly scattered among the German population, even to those who do not identify themselves as big fans of the national team. It seemed as though the whole population was engrossed in the event hosting and thus, celebrated with their team (Ohmann, Jones and Wilkes, 2006), indicating that an individual's identification with the national team is an important aspect. Every mega-sport event has an impact on the population; a review on health and socioeconomic impacts of these events summarized that most literature analyzes the economic impact (n=18, 33%), while few studies (n=5, 9%) focus on residents' health outcomes (McCartney et al., 2010b). The main body of literature on mega-sport events in this review was grey literature (n=25, 46%), and about half of the studies were published in peer-reviewed journals. Most research findings on the impact of mega-sport events are published as a report (e.g. London 2012 Post Games Sustainability Report – A legacy of change published by the London Organizing Committee of the Olympic Games). The disadvantage of these articles is that the credibility is not clear, because, articles are not read and approved by experts. Knowing this, the aim of this thesis is to contribute to the scientific field of mega-sport impact research, more specifically, to investigate the health impacts on residents living in cities hosting mega-sporting events. In addressing aforementioned topics, the following first research question was raised to guide the thesis: *Do residents in a host city of a mega-sport event experience a change in their short-term health outcomes per se?*

Literature suggests that positive health outcomes from hosting per se cannot be expected (Kaplanidou et al., 2013). Instead, the impact of contextual factors on these outcomes is important. These factors can act as determinants of health and can therefore be more important than the direct impact on residents' health (Wellings, Datta, Wilkinson and Petticrew, 2012). This leads to the second research question: *Do contextual factors matter in the change of residents' quality of life?*

The conceptual model is shown in Figure 1. The first four hypotheses (H1-H4) investigate the effect of perceived atmosphere on the four quality of life domains. The next four hypotheses (H5-H8) investigate team identification and its effect on the four quality of life domains. The mediating effect of national identity in the relationship between team identification and quality of life is investigated in the last four hypotheses (H9-H12).
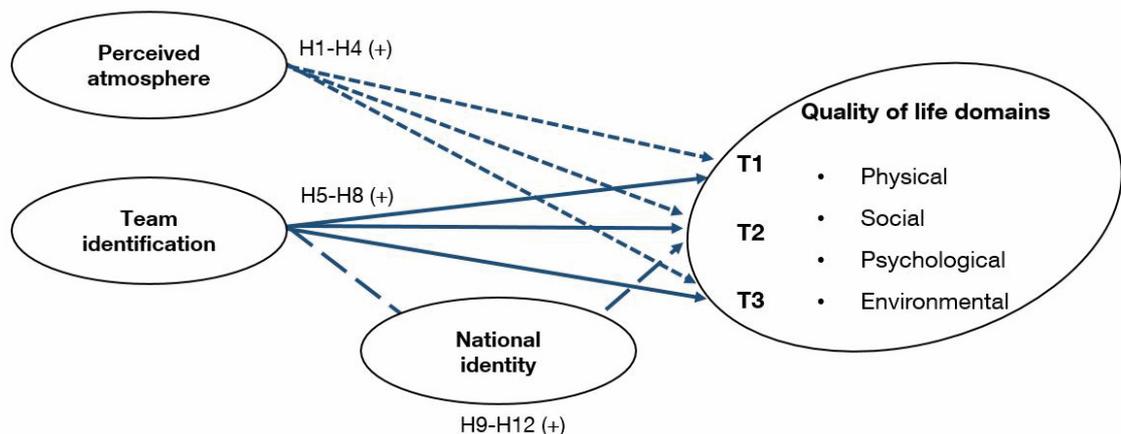
Figure 1: Study model
Source: Own illustration

To answer the questions raised in the section above, two analyses were conducted within this thesis. In the first analysis a piecewise growth model was

used to analyze the change in quality of life and team identification over three time points. Using this data in further analyses the effect of event atmosphere (measured during the event) and identification with the national team on the aforementioned change was included in the respective model (i.e., at the beginning of the event, in the end of the event, and three months after the end of the event). In the second analysis, a regression-based mediation analysis was run including team identification as the independent variable, national identity as a mediator, both measured in the beginning of the 2014 FIFA World Cup (in T1) and quality of life as the dependent variable, measured right after the 2014 World Cup (in T2).

The remainder of this thesis is organized as follows (see Figure 2). The thesis starts off with an introduction detailing the research questions and objectives of the study, i.e. **Chapter 1**. **Chapter 2** provides the theoretical background including an introduction to the following subsections: mega-sport event hosting, the legacy concept of mega-sport events, the conceptualization of health and quality of life, and an introduction to the impact of mega-sport events on host city residents' quality of life.

The empirical part of this thesis starts with a description of the research methodology in **Chapter 3**, including a description to growth modeling and mediation analysis, the data collection, the measures used in the different studies and a sample description over the three waves. **Chapter 4** presents the first analysis, i.e., the results of the piecewise growth modeling. First, the theoretical background of this study is described, followed by: Subsections introducing the concept of quality of life in the context of mega-sport events, the

relevance of perceived atmosphere during the event, and the relevance of team identification during the event. The results are reported separately into five subsections: The results for the change in quality of life, the effect of perceived atmosphere on this change, the change in team identification, and the effect of team identification on the change in quality of life; and the results for combined analyses are presented. **Chapter 5** discusses the second analysis, i.e., the regression-based mediation analyses investigating if national identity mediates the effects of team identification on the four dimensions of quality of life. The thesis ends with the conclusion, giving a general discussion of the results in **Chapter 6**. The chapter also provides an overview of the findings, a summary of the implications and highlights limitations and possible future research of the findings. **Chapter 7** is a section at the end of the thesis that draws out the conclusions.
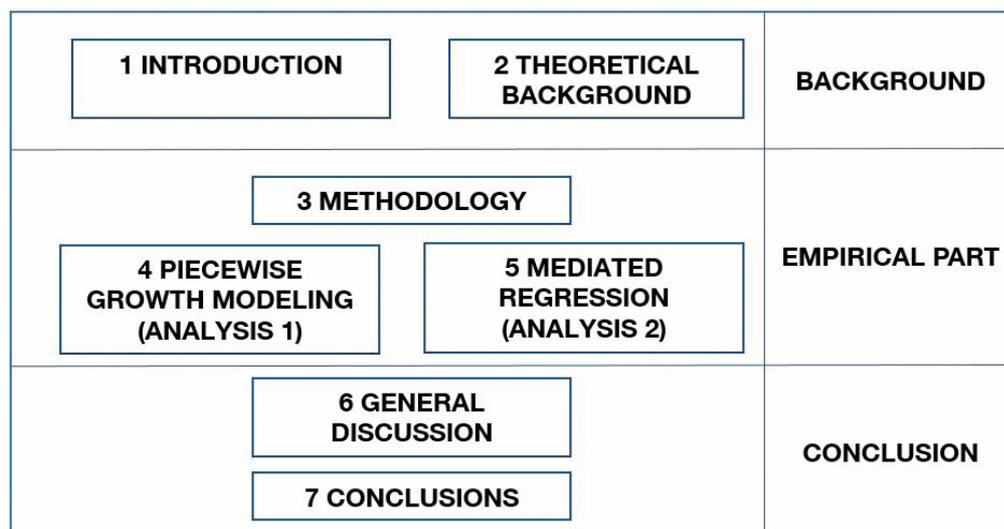
Figure 2: Thesis structure
Source: Own illustration

2 THEORETICAL BACKGROUND ON QUALITY OF LIFE IN THE CONTEXT OF MEGA-SPORT EVENTS

2.1 Definition of mega-sport events

Mega-sport events are international events with global reach, i.e. they are events where numerous countries or cities compete in a specific sport. According to an overview provided by Müller (2015), researchers did not agree on one single definition of what mega-sport events are, but on several characterizing requirements, including number of tickets sold, media reach, total costs and capital investment. Dependent on the size of these four dimensions, an event can be categorized as a major, mega or giga event (see APPENDIX A). In this thesis, the term mega-sport event is used synonymously for any of these events. Events can be defined as mega events if they are limited in time, not permanently held within a defined and short period attracting a large international audience who attend in person or follow the event via the media. These events are associated with high costs, which among other things usually lead to an improvement of the city's infrastructure due to the fact that money is invested, which eventually would otherwise not have been spent. On the other hand "the same money could have been invested in integration projects that indirectly reduce crime and also make a city more attractive for tourists" (Preuss, 2007, p. 212).

These events are further characterized by their competing multinational athletes and can be aligned anywhere in the world in exactly the same manner and under the same rules, regardless of the actual location of the local culture or the political and economic system (Barclay, 2009; Fayos-Solá, 1998; Jago et al.,

2010). The chronological sequence of hosting a mega-sport event is illustrated in Figure 3. The process starts in the pre-event phase which includes the bidding and acceptance (or rejection) of the event hosting. The acceptance of Brazil as the host country for the 2014 FIFA World Cup was announced in 2007, seven years before the actual event takes place, to ensure host cities are able to make all necessary preparation for the event hosting (Preuss, 2015). Compared to the other phases, the event phase itself is very short, and lasts about one month. This is when the short term or immediate impact of having the event hosting can be assessed. In the beginning of the post-event phase all temporary sports facilities are deconstructed. In this phase, the long lasting impact, and the event legacies are investigated, which can occur 10 years or later after the actual hosting (Preuss, 2007).
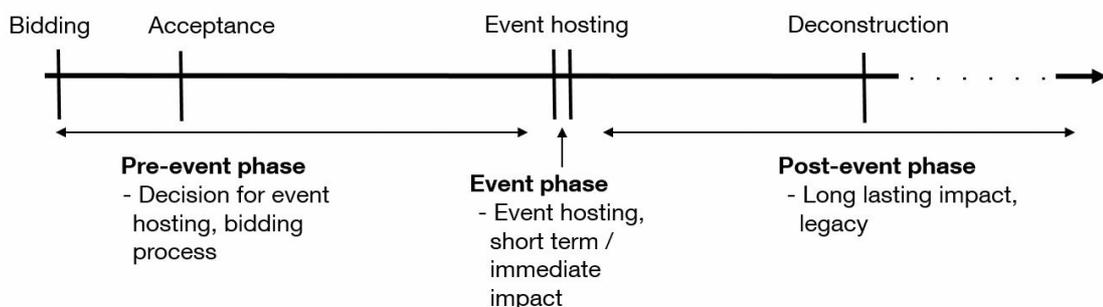
Figure 3: Chronological sequence of hosting a mega-sport event
Source: Own illustration based on Preuss (2015) and Emery (2003)

In this thesis one of the biggest mega-sport event is researched, the FIFA World Cup (Müller, 2015), in the context of which the data were collected. The hosting of mega events in the sports world has become more and more costly, raising concerns from candidate host city populations whether their city (or nation)

should host such events at all. One of the main concerns raised by city residents are the costs involved when hosting mega-sport events (Kim, Jun, Walker and Drane, 2015). Some city residents even actively oppose to the candidature of their city. For example, recent referendums made Munich, Oslo, and Hamburg – potential Olympic Games host city candidates – withdraw their already planned candidature for the 2022 and 2024 Olympic Games, respectively.

Thus, it is not surprising that the previous literature has mostly looked at the economic consequences of hosting mega-sport events (McCartney et al., 2010b). This thesis provides a different perspective of event hosting, one that examines the health dimension of residents. The media reinforces the negative mood in the population, e.g. with a recent article in the weekly newspaper The Economist with the title "Just say no. Hosting the Olympics and the World Cup is bad for a city's health" (The Economist, 2015). The article mostly questions if (long-term) benefits exceed construction and maintenance costs. To counteract the pessimistic attitude against mega-sport events it could be an argument to disprove this statement and to demonstrate how the residents themselves also benefit from hosting these events. Therefore, beside the already investigated economic, environmental, and social dimension of legacy (Preuss, 2007), another argument would concern the potential positive health impacts, which are investigated in this thesis.

2.2 Legacy of mega-sport events

Event legacy refers to the sustainable, long-lasting consequences that the hosting of an event has on the society, long time after the event was hosted.

Aforementioned economic consequences belong to just one dimension of the
so-called legacy framework of the effects of the hosting of mega-sport events
(Cashman, 2006; Ritchie, 1984).

Event legacy can be described along three key dimensions: the economic, the
environmental, and the social dimension (Preuss, 2007). Legacies can further
be classified as being tangible and intangible. Examples for intangible outcomes
are the country image or health outcomes, i.e. outcome that are harder to
measure. Tangible outcomes on the other hand are clear to capture and include
economic measures such as employment rate or income (Kaplanidou and
Karadakis, 2010; Preuss, 2007). There are also positive and negative legacies.
An example for positive legacy is accelerated development, which benefits the
city's infrastructure (Preuss, 2007); it can support the development of a host city
for example - such as seen in Munich, Germany, where the subway and Olympic
park were built after the city won the bid for hosting the Olympic Games in 1972.
Sports federations and event organizers take into consideration the
sustainability and long-lasting effects of mega-sport events. To ensure that the
society profits from a positive legacy, the International Olympic Committee
included the event legacy principle into their Olympic Charter; stating that their
goal was to "promote a positive legacy from the Olympic Games to the host city
and host country" (International Olympic Committee, 2003). Mega-sport event
property holders, such as FIFA and Union des Associations Européennes de
Football (UEFA), have similar mission statements. While the intentions of mega
events committees are true and positive in nature, it is possible that a negative
legacy occurs, which could be debts from construction costs or unneeded

infrastructure e.g. sport facilities (Preuss, 2007), although in practice, only positive legacies are mentioned and focused in event planning processes by the organizing committees (Cashman, 2006).

However, there are some limitations to the legacy conceptualization presented above. First, the concept focuses on long-term consequences only and neglects the short-term and (potentially fading) consequences. Mega-sport events usually last for days or weeks (some even for one day) and have an immediate impact on the host population. This is seen through the population, when people feel inspired by the flair of their home town, feel proud when their home team (or their national team) competes with the best teams (or athletes) in the world, and have the feeling that their city is important due to the media attention from all over the world (Gold and Gold, 2008; Kim and Walker, 2012). Thus, some impact on the host population, such as host city residents' emotions, may be immediate rather than long-term in nature (Kavetsos and Szymanski, 2010). These immediate impacts of positive emotions can lead to short-term improvements of residents' health outcomes (Howell, Kern and Lyubomirsky, 2007).

Second, the three key legacy dimensions do not specifically take into account health-related aspects of individuals that live in the area where the event is hosted. Although some authors have provided conceptual arguments that any increase in these three dimensions can in turn have a positive impact on residents' health status (Preuss, 2015), thus looked upon as an indirect impact, health outcomes are rarely mentioned as a possible direct outcome of the legacy of a mega-sport event (Knott, Fyall and Jones, 2013). Therefore, it remains

unknown whether and when the hosting of mega-sport events increases the health status of host city residents.

This thesis aims to partially fill the aforementioned research gaps and looks at the short-term (and potentially fading) consequences of hosting a mega-sport event on the quality of life of host city residents. That is, the subjective evaluation of an individual's health status (WHOQOL Group, 1995) – over the course of the hosting of the event until three months after the event, depending on residents' perception of the atmosphere in the city. The period of measurement before, (during) and three month after the end of the event was chosen in previous studies (Gursoy and Kendall, 2006; Kim, Gursoy and Lee, 2006; Kim and Petrick, 2005) and relates to the short-term impacts of the event, caused by the emotions felt during the event, which can vanish after a short period (Kavetsos and Szymanski, 2010). In the period three month after the event hosting, the emotional arousal is expected to be no longer present.

A favorable atmosphere might be crucial in order to obtain positive subjective health-related outcomes because city residents tend to get involved in the event and experience the event with all senses (Slabbert and Thomas, 2012). For example, German residents reported high enthusiasm in host cities during the 2006 FIFA World Cup due to the special atmosphere during the event hosting, a feeling which they did not perceive prior to, or after, the event (Ohmann et al., 2006). Kavetsos and Szymanski (2010, p. 167) note that based on their study of the impact of mega-sport events on the host population's happiness, the results of their analysis "do not justify the inference that hosting events creates anything more than a short term feelgood factor."

Atmosphere and team identification are two constructs that might provide explanations for these effects. The theoretical foundations of the studies are introduced in the respective chapters.

2.3 Health and quality of life as a potential legacy outcome

The aim of this thesis is to investigate the impact of hosting a mega-sport event on residents' health, the dependent variable in this thesis. Therefore, the constructs of health and quality of life are as follows: As defined by the World Health Organization (WHO), "health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (World Health Organization, 1946, p. 100). This broad definition does not only take into account an individual's morbidity or mortality, but considers health as a multidimensional construct that includes a physical, psychological, and social components. The definition has been criticized for including the word "complete" because absolute health can hardly be achieved by most individuals as people often suffer from at least some minor issues (Huber et al., 2011). Despite this criticism, the definition provides a meaningful sub-classification of health dimensions. The bio-psycho-social model likewise proposes a multi-dimensional classification of health (Engel, 1977). The model, building upon the WHO's definition of health, considers health as having biological, psychological, and social components. Subsequently to when this model was proposed, researchers and practitioners have started looking at an individual's health from the perspective of these multiple domains (Eberst, 1984). The quality of life is

the subjective evaluation of one's health status. Regarding positive quality of

life outcomes, these are indicators that an individual's health is at high levels.

The WHO defines quality of life as "an individual's perception of their position in

life in the context of the culture and value systems in which they live, and in

relation to their goals, expectations, standards and concerns" (WHOQOL Group,

1995, p. 1405). Quality of life reflects an individual's health with all surrounding

aspects. Thus, in addition to the three health dimensions presented above a

fourth dimension was added, i.e., contextual factors, which covers the

environment in which people live, i.e. the surroundings of individuals (Ferrans,

Zerwic, Wilbur and Larson, 2005). The Institute of Medicine (1995) defines

environmental health (another term used for contextual factor) as "freedom from

illness or injury related to exposure to toxic agents and other environmental

conditions that are potentially detrimental to human health" (p. 3). These harmful

factors include exposure to physical, chemical, and biological stimuli, for

example. Also, aspects like safety of the environment, affordability, access to

information, access to transportation system, access to health services and

leisure activities, and the conditions of living places are included (WHOQOL

Group, 1998). The environmental health domain is important during the hosting

of mega-sport events because host cities typically invest in infrastructure to

guarantee an appealing appearance and provide a flexibility of commute during

the event (Preuss, 2007). To account for these findings, quality of life today is

most frequently measured using the WHO's measurement tools, which proposes

a four-dimensional structure: physical, social, psychological, and environmental.

Generally,   the   measurement   of   an   individual's   quality   of   life   as   a

multidimensional construct of health outcomes is now an established method in health care across Europe and in the USA (Bowling, 1995). The literature on the impact of mega-sport events on host city residents' quality of life is presented in the next subsection.

2.4   Impact of mega-sport events on host city residents' quality of life

There are currently few empirical studies that have used the aforementioned four-domain framework, reflecting the quality of life of an individual. As described below, previous studies have looked at the health impact of mega-sport events from different perspectives. These studies can be categorized into three different types of studies. The first type focuses on one of the domains only (and selected indicators within these domains) and its change over time. The second type of studies uses a simple overall measure of health or health-related aspects and assesses its change over time. The third type of studies does not look at changes in health or health-related aspects over time, but considers changes in the relationships between determinants of health or health-related aspects and health outcomes at different points in time (e.g., before, during or after the event). An overview of the primary studies on the health impact of mega-sport events can be found in APPENDIX A.

The thesis will now address examples of each type of case study and how mega-sport events impact health outcomes. As mentioned earlier, many previous studies have considered one single health domain. In regards to the physical domain of health, researchers assessed the impact of hosting a mega-sport event on the number of hospital admissions from illicit drug use and childhood

asthma hospitalization in the host city (Friedman et al., 2001; Indig et al., 2003; Lee, Son and Cho, 2007). Other research was conducted on the demand for pediatric health services in the host city, using secondary data (Simon, Stegelman and Button, 1998). The results from the studies are as follow: Hospital admissions for adverse events due to illicit drug use increased during the event, and there was a slightly increase in the demand for pediatric health services. Hospitalization for childhood asthma decreased most likely due to better air quality (because traffic could be reduced). There is also some evidence for an increase in mortality from heart diseases during the hosting of mega-sport events. For example, the relative risk to die from a heart disease for Dutch men increased to 1.51 (no effect was found for women) when they followed the Netherlands' national soccer team during the 1996 European soccer championship (Witte, Bots, Hoes and Grobbee, 2000). Another study reported an increased relative risk for German spectators, 3.26 for men and 1.82 for women, on days where the German national soccer team was playing (Wilbert-Lampen et al., 2008). Another database study also reported an increase in relative risk for hospital admission of 1.25 during event days (Carroll et al., 2002). To conclude, the hosting of mega-sport events can lead to negative or positive physical health outcomes, when referring to hospital admissions. However, there is few evidence about changes in physical health from the subjective perspective of individuals and outside hospital settings. Also, few studies considered potential changes in social, or psychological, or environmental health in response to the hosting of mega-sport events.

The second type of study, i.e., using a simple overall measure of health or health-related aspects, has also been minimally researched. One example is provided by Kavetsos and Szymanski, (2010) who assessed how hosting of a mega-sport event can impact residents' satisfaction with life; this was illustrated in twelve European countries that hosted different mega-sport events over the course of thirty years (from 1974 until 2004) using Eurobarometer Survey Series data. Satisfaction with life (or "happiness," as argued by the authors) may be considered as an indicator of subjective health (or subjective psychological health). The study showed that the hosting of the Olympic Games had either no significant or even a negative effect on satisfaction with life, controlling for a number of macro-level and personal factors, but that the hosting of a soccer event can increase satisfaction with life independent of the success of the national soccer team. Although the authors used secondary data only, this study provides suggestive evidence that satisfaction with life (or [psychological] health) may increase when nations host mega-sport events in soccer.

The third and last type of study looks at the relationship between determinants of health or health-related aspects and health outcomes at different points in time. Kaplanidou et al. (2013) identified predictors of satisfaction with quality of life of the South African population before and after the 2010 FIFA World Cup. The results indicate that three months before the event, political and psychological impacts as well as social benefits were positive predictors of satisfaction with quality of life. Eight months after the event, economic impacts as well as the three determinants mentioned beforehand were significant and positive predictors of satisfaction with quality of life of the South African

population (Kaplanidou et al., 2013). However, it remains unclear how the host

city residents rated their quality of life during the event. Also, the authors used

a simple overall measure of quality of life – the question asked in the survey was

"Overall, taking everything into account, I am very satisfied with my quality of

life", that has some overlap with the concept of satisfaction with life. Another

limitation concerns the study design of a repeat cross-sectional study, which is

the use of different samples at the two time points. One has to expect that many

potential confounders can have an impact on an individual's quality of life in that

period.

To conclude, there are no empirical studies that (1) use the four-domain

framework of quality of life in the context of the hosting of mega-sport events,

(2) assess the change in quality of life over time using the same sample (i.e., a

longitudinal study), and (3) collect primary data during the time when the event

actually took place. This thesis addresses all of these aspects as it considers

quality of life as a multidimensional construct (consisting of physical, social,

psychological, and environmental health). It further assesses the change in the

four domains of quality of life over time using the same sample, and measures

the four domains of quality of life during the event as opposed to reference

values (i.e., at the beginning of the event and three months after the end of the

event). Previous research provides suggestive evidence that there may be no

main effect on the quality of life of host city residents by merely hosting an event

(Kaplanidou et al., 2013). In this thesis, perceived atmosphere and team

identification are considered as variables that may influence how host city

residents respond to the hosting of mega-sport events as regards their quality

of life. The theoretical background of these variables and their potential impact on residents' quality of life is described in Chapter 4.1.

3 METHODOLOGY

The present thesis is composed of two empirical parts, presented as analysis 1 (Chapter 4) and analysis 2 (Chapter 5). Each analysis addresses a specific method used to analyze the determinants of residents' quality of life. Because each study deals with its own research question, the development of the hypothesis as well as the research methodology is directly linked: Both studies are presented separately with their own chapter. The applied measures and methods for data collection and analysis, which are the same in both studies, are indicated below. Analysis 1 was analyzed using piecewise growth modeling (Chapter 3.1), while in analysis 2, a mediated regression analysis was used (Chapter 3.2).

3.1 Sample description

Four hundred and ninety eight individuals from Rio de Janeiro participated in the first wave of the study (i.e., pre-event). Of those, three hundred and sixty-one took part in the second wave (i.e., end of the event). Lastly, two hundred and eighty-one participants took part in the study in all the three waves (i.e., measurement three month after the event).

Table 1 provides an overview of the characteristics of the study participants at T1, T2 and T3. In the first wave, fifty-one percent of the participants were male. This proportion slightly increased to 57% in the third wave. In all waves,

participants were between 19 and 80 years old. The mean age slightly increased from 42.8 years (± 13.1; median 41.5) in T1 to 43.3 years (± 13.5; median = 43.0) in T3. Participants had been living in Rio de Janeiro for 38.2 years (± 15.5) in T1, and for 38.5 years (± 15.8) in T3. The majority of participants had earned a bachelor's degree or a higher degree (71% in the first wave, 75.3% in the third wave). Twenty-one percent earned the equivalent of a high school degree, these are indicators of a well-educated sample. The average size of the household was 3.3 (± 1.4), which remained nearly constant in T3 (mean 3.1, ± 1.4). The majority of participants in this sample was either married (57.9% in T1, 58.9% in T3) or single (26.0% in T1, 27.2% in T3). Across the three waves, the sample was slightly older compared to the general population of Rio de Janeiro, because, according to IBGE (2010), about half of the population is 34 years old or younger. Forty seven percent of the residents of Rio de Janeiro are male. In 2014, 13.0% of the general population in Brazil (25 - 64 years) had an academic degree, and 55.0% of the Brazilians achieved the equivalent of a high school degree (OECD, 2014). Thus, statistics indicate a well-educated sample compared to the general population. This is reasonable, as more well-educated Brazilians live in cities and they use the Internet more often (IBGE, 2013), and thus are more likely to participate in Internet-based studies.

Table 1: Characteristics of the study participants in T1, T2, T3
Source: Own table

Variable	T1	T2	T3
n	**498**	**361**	**281**
Gender, male, %	53	56	57
Age, M ± SD	42.8 ± 13.1	43.1 ± 13.2	43.3 ± 13.5
median	41.5	42	43
[min - max]	[19 – 80]	[19 – 80]	[19 – 80]
Years living in Rio, M ± SD	38.2 ± 15.5	38.2 ± 15.7	38.5 ± 15.8
[min - max]	[0.3 - 74.5]	[0.3 - 74.5]	[0.3 - 74.5]
Games watched, M ± SD	---	4.9 ± 2.3	
[min - max]		[0 - 7]	---
Persons in household, M± SD	3.3 ± 1.3	3.3 ± 1.3	3.1 ± 1.4
[min - max]	[1 - 8]	[1 - 8]	[1 - 8]
Educational level, %			
Academic degree (master)	48.5	50.3	52.0
Academic degree (bachelor)	22.5	23.5	23.3
High School degree	24.6	22.1	20.8
Elementary school degree (9 years of education) or less	4.4	4.1	3.9
Marital status, %			
Single	26.0	25.6	27.2
Married	57.9	59.7	58.9
Divorced	8.7	7.5	7.5
Domestic partnership	6.0	6.1	4.6
Widowed	1.4	1.1	1.8

3.2 Data collection

The data collection took place in the context of the 2014 FIFA World Cup in soccer. The FIFA World Cup is the biggest mega-sport event beside the Olympic Games with regard to global television viewership and broadcasting rights, visitor attractiveness e.g. on-site attendance, and revenue from ticket sales, with high economic impact (Kesenne, 2012; Müller, 2015). The 2014 FIFA World Cup was held at twelve different Brazilian host cities from June 12th to July 14th, 2014.

This study took place in Rio de Janeiro, the host city where the championship final was held (among other games).

Data were collected during the first week of the World Cup (first wave; T1), during the week right after the World Cup (second wave; T2), and during the week three months after the end of the World Cup (third wave; T3). Individuals were only allowed to participate in the study if they were permanent residents of Rio de Janeiro, making sure that the study truly considered the host population of the event, as recommended by Weed (2010). The software unipark by Globalpark GmbH was used to construct an online survey (see survey questionnaire in APPENDIX B).

City residents of Rio de Janeiro who were at least 18 years old were recruited via a Brazilian market research agency, which distributed the survey link by email to their panel members. The agency incentivized their panel members to take part in the study. Those answering the first survey were contacted to take part in the second and third survey, respectively. In the survey, participants were first told that the study was about their well-being. After they gave their consent of participation, they filled in the questionnaire. At the end of the survey, participants were thanked for their participation and were invited to participate in another survey three months later. Quality of life and team identification were assessed in all three waves. In the second wave, participants were asked about their experience during the World Cup (including perceived atmosphere) in addition to the items that have been assessed in the surveys before and after. In the third wave, participants were fully debriefed about the true nature of the

study. The average amount of time required filling out the questionnaire was 23, 20, and 17 minutes, in T1, T2 and T3, respectively.

3.3 Data analysis

Growth modeling

Latent growth modeling is used as a structural equation modeling (SEM) technique to estimate growth trajectory. When more than two time points are measured, SEM bears the advantage to analyze the individual change over several time points. A way to model non-linear growth is the piecewise linear growth model. In this model each piece has its own slope growth factor but only one intercept growth factor i (Muthén and Muthén, 2007). Thus, the model allows the change in quality of life to vary from T1 to T2 and from T2 to T3 without imposing a constant rate of change over time (Bollen and Curran, 2006, p. 103). The use of such model is recommended when linear change is not anticipated and/or does not fit the data (Flora, 2008). Piecewise linear growth models were used for data analysis of the first study of this thesis. The exact model specification will be described in Chapter 4.2.3.

Mediation analysis

Mediation is used to analyze to which extent the effect of a variable on an outcome variable Y (the dependent variable) is mediated through another variable (MacKenzie, Podsakoff and Podsakoff, 2011). In the past, mediation has been analyzed using the approach described by Baron and Kenny (1986). According to the authors, "full mediation" is the gold standard in mediation

analysis, meaning there is an indirect effect but no direct effect. However, in practice, most of the published articles report "partial mediation" in their results, which is the occurrence of not only indirect, but also direct effects. Also the method by Baron and Kenny is criticized (Zhao, Lynch and Chen, 2010) and newer approaches for mediation analysis have been established. A useful procedure for mediation analysis has been written as a macro for SPSS, called PROCESS. This procedure is provided by Andrew F. Hayes (Hayes, 2013). The significance of the indirect path in this method is not analyzed by the Sobel test (as it was used in the past), which is only suitable to use in large samples (Sobel, 1982). As an alternative, bootstrapping has replaced the Sobel test (Bollen and Stine, 1990; Shrout and Bolger, 2002), which bears some advantages. It is a non-parametric method repeating the analysis with random samples, e.g., 1000 times. Because of this process, a confidence interval is computed. To test the significance of the indirect effect bootstrapping procedures are implemented in PROCESS (model 4, Hayes, 2013, p. 445). With regard to the bootstrapping, mediation is significant if the confidence interval does not include zero (Preacher and Hayes, 2008).

3.4 Measures

Valid and reliable scales were used to measure the dependent variable quality of life, and the independent variables event atmosphere and team identification as well as the mediator national identity. Quality of life was assessed in all three waves. The construct was measured using the WHO's quality of life instrument. It is based on the WHO's definition of quality of life and initially had 100 items

(WHOQOL Group, 1995, 1998), while the shorter version WHOQOL-BREF consists of 24 items (5-point rating scale; 1 = lowest rating, 5 = highest rating). The use of the shorter version is recommended when time is restricted and "where a brief assessment of quality of life is appropriate," such as for longitudinal studies (WHOQOL Group, 1998, p. 557). The WHOQOL-BREF has been validated across different cultural groups (Skevington, Lotfy and O'Connell, 2004). It has also been validated in Brazilian Portuguese, the language that was used in the survey (Fleck et al., 2000). The items of the four dimensions of the WHOQOL-BREF (physical, social, psychological, and environmental domain) are shown in Table 2.

Cronbach's alphas across the three waves are illustrated in Table 3. Compared to the validation study (Skevington et al., 2004), in most cases, the scales had similar or higher values of Cronbach's alpha. The reason for this inconsistency might be due to the heterogeneity of the questions in this scale, referring to pain, medication needed, and limitations in everyday life. However, internal consistency of the four domains of the WHOQOL-BREF was good, as indicated by Cronbach's alphas larger than 0.7 (Lance, Butts and Michels, 2006; Nunnally, 1978).

Table 2: Items of the WHOQOL-BREF
Source: Own table

Domain	Question
Physical domain of quality of life	To what extent do you feel that physical pain prevents you from doing what you need to do?
	How much do you need any medical treatment to function in your daily life?
	Do you have enough energy for everyday life?
	How well are you able to get around?
	How satisfied are you with your sleep?
	How satisfied are you with your ability to perform your daily living activities?
	How satisfied are you with your capacity for work?
Social domain of quality of life	How satisfied are you with your personal relationships?
	How satisfied are you with your sex life?
	How satisfied are you with the support you get from your friends?
Psychological domain of quality of life	How much do you enjoy life?
	To what extent do you feel your life to be meaningful?
	How well are you able to concentrate?
	Are you able to accept your bodily appearance?
	How satisfied are you with yourself?
	How often do you have negative feelings, such as blue mood, despair, anxiety, depression?
Environmental domain of quality of life	How safe do you feel in your daily life?
	How healthy is your physical environment?
	Have you enough money to meet your needs?
	How available to you is the information that you need in your day-to-day life?
	To what extent do you have the opportunity for leisure activities?
	How satisfied are you with the conditions of your living place?
	How satisfied are you with your access to health services?
	How satisfied are you with your mode of transportation?

Table 3: Cronbach's alpha across three waves in comparison to Skevington et al.'s (2004) validation study for Brazil (n = 308)
Source: Own table

	T1	T2	T3	Validation study
Physical domain	.77	.73	.79	.84
Social domain	.81	.78	.78	.68
Psychological domain	.79	.77	.81	.78
Environmental domain	.85	.86	.86	.71

Notes. The physical, social, psychological, and environmental domains are part of the WHOQOL-BREF. T1 indicates the measurement during the first week of the event, T2 indicates the measurement one month later during the week right after the World Cup, and T3 indicates the measurement four months after T1 (i.e., three months after the event had ended).

Perceived atmosphere during the FIFA World Cup. This construct was measured via a seven-item scale representing reflective indicators, anchored at 1 = 'do not agree at all' and 5 = 'fully agree' (Uhrich and Benkenstein, 2010). The scale was originally developed as the Multiple Indicators Multiple Causes model (MIMIC) to measure atmosphere in sport stadiums, which is why we fit the items to the context of the study (i.e., we changed the wording from "in the stadium" to "during the World Cup"; see Table 4). Since there was no version available in Brazilian Portuguese, two independent native speakers translated the questions using the forward-backward method. This translation method is recommended by the WHO in order to ensure the reliability of the translated scales (World Health Organization, 2005). The scale was found to be reliable; Cronbach's alpha was .94.

Table 4: Items of perceived atmosphere, mean ± SD
Source: Own table

Domain	Question	Mean ± SD
	During the World Cup….	
	1) There are amazing vibes	3.7 ± 0.9
	2) There is tremendous enthusiasm	3.7 ± 1.0
Perceived atmosphere (α .94)	3) You experience really strong emotions	3.8 ± 0.9
	4) The atmosphere gives you goose bumps	3.6 ± 1.0
	5) There's a real thrill in the air	3.4 ± 1.1
	6) You get caught up in the general euphoria	3.3 ± 1.1
	7) You get a real high	3.3 ± 1.0

Team identification. To measure the degree of identification with the national soccer team we used a validated uni-dimensional seven-item scale (see Table 5 for items and means ± SD), the Sport Spectator Identification Scale (SSIS, Wann and Branscombe, 1993). Items were formulated as questions and answers were rated on a seven-point rating scale (1 indicating 'not fan', 7 indicating 'avid fan'). The mean was calculated for the seven items. The SSIS is a verified instrument that has high reliability and validity (Wann and Branscombe, 1993; Wann, Hunter, Ryan and Wright, 2001). The scale is available in different languages. The Portuguese item formulations were used, as this scale was evaluated as reliable (α = .76) and valid (Theodorakis, Wann, Carvalho and Sarmento, 2010). In this data, the lowest item ratings had the questions "How much do you dislike the team's greatest rivals?" (mean 3.3 ± 2.0), and "How often did you display the team's name or insignia at your place of work, where you live, on your vehicle, or on your clothing?" (3.5 ± 2.2). The highest item rating with a mean of 5.5 (± 1.9) had the question "How strongly do your friends see you as a fan of the team?"

For the other item means ranged between 4.8 (± 2.2) to 5.1 (two items: ± 2.2 and ± 2.3); Cronbach's alpha of the scale was .91.

Table 5: Items of the sport spectator identification scale, mean ± SD
Source: Own table

	Question	Mean ± SD
	1) How important to you is it that the team wins?	5.1 ± 2.3
	2) How strongly do you see yourself as a fan of the team?	4.9 ± 2.1
	3) How strongly do your friends see you as a fan of the team?	5.5 ± 1.9
Sport spectator identity scale (α .91)	4) During the World Cup, how closely did you follow the team via the media?	5.1 ± 2.2
	5) How important is being a fan of the team to you?	4.8 ± 2.2
	6) How much do you dislike the team's greatest rivals?	3.3 ± 2.0
	7) How often did you display the team's name or insignia at your place of work, where you live, on your vehicle, or on your clothing?	3.5 ± 2.2

National identity. National identity was measured via a four-item scale (Huddy and Khatib, 2007). Items are shown in Table 6. Each item is rated on a five-point Likert scale anchored at 1 = 'low national identity', 5 = 'high national identity'. The items had very similar means, which ranged from 3.9 (± 1.1) to 4.1 (± 1.1); Cronbach's alpha of the four items was .93 (see Table 6). Items were translated, using the forward-backward translation method by native speakers. The context of the original scale was different, which is why the wording "American" of the original scale was replaced with "Brazilian" (see above).

Table 6: Items of the national identity scale, mean ± SD
Source: Own table

	Question	Mean ± SD
National Identity (α .93)	1) How important is being Brazilian to you?	3.9 ± 1.2
	2) To what extent do you see yourself as a typical Brazilian?	4.1 ± 1.1
	3) How well does the term Brazilian describe you?	3.9 ± 1.1
	4) When talking about Brazilians how often do you say "we" instead of "they"?	4.0 ± 1.2

4 EMPIRICAL PART: PIECEWISE GROWTH MODELING (ANALYSIS 1)

4.1 Theoretical background of the first analyses

To date, there are no studies that have looked at the change in quality of life of host city residents – that is, the subjective evaluation of an individual's health status (World Health Organization, 2005) during the course of mega-sport event hosting. This analysis aims to partially fill this research gap and looks at the influence of two contextual factors on residents' quality of life. The first factor is residents' perception of the atmosphere during mega-sport events on quality of life, taking into account the physical, social, psychological, and environmental domains of health. A positive evaluation of the atmosphere can mean a difference in positive subjectively measured health-related outcomes because city residents often tend to enjoy (or complain about) their experience of the event in the city as well as the special atmosphere of the event (Ohmann et al., 2006; Slabbert and Thomas, 2012). The second factor, impacting on the quality of life that is analyzed is team identification. Those being highly identified fan of

the national team have a higher sense of belonging to the social group of fans, which can be expected to lead to positive health outcomes. Evidence for higher social psychological health outcomes in fans of a local team has been reported before in Wann's team Identification-Social Psychological Health Model (Wann, 2006).

In what follows, arguments are provided for how the different dimensions of quality of life might change during (and after) the hosting of a mega-sport event depending on the (1) atmosphere perceived and (2) team identification. The two independent variables, event atmosphere and team identification differ in their temporal occurrence. Event atmosphere occurs rather infrequently in a city and only for a short period, this usually happens during the event. By comparison, team identification is a construct that is not directly related to the event hosting, but it forms over an extended period and persists over time, as it is "one of the few constant things in your life, the team you support" (Lock, Taylor, Funk and Darcy, 2012, p. 287). Researchers showed that the degree of identification with a team is subject to change, as it depends on factors such as wins and losses of the team (Stieger, Götz and Gehrig, 2015). Therefore, the change in team identification and its effect on quality of life was analyzed over the three waves, while event atmosphere was only measured during the event and thus it was included in the model in one time point, measured in T2.

In what follows next, perceived atmosphere is conceptualized and arguments are provided for how perceived atmosphere may affect the change in the four quality of life domains during the course of the hosting of the event (and after the event).

4.1.1 Relevance of perceived atmosphere during mega-sport events

This study considers the atmosphere in the host city of a mega-sport event as one factor that might affect the development of quality of life over time. Despite the fact that atmospheric elements of sports are one central element of the "service" that is provided to spectators (Uhrich and Benkenstein, 2010), atmosphere is rarely mentioned as one of the features of hosting mega-sport events (e.g. Fredline, 2005; Hall, 1992; Ritchie, 1984). In the marketing discipline, the term "atmospherics" was first introduced by Kotler (1973) who referred to atmospherics as the impact of environmental sensory stimuli, such as sight, sound, smell, and touch, on consumers. Referring to this conceptualization, atmosphere can be defined as "the totality of emotionally appealing environmental stimuli in a defined place" (Wochnowski, 1996, p. 181). Mehrabian and Russell's (1974) environmental psychology behavioral model can be used as a theoretical framework to assess the effects of atmosphere on the emotional and behavioral reactions of individuals. The model postulates that both environmental stimuli and personality factors influence three primary emotional reactions of individuals: pleasure, arousal, and dominance. These emotions then trigger behavioral reactions: approach and avoidance. Prior studies have used the model to develop a research framework for the effects of atmosphere at sport stadiums on spectators (Uhrich and Koenigstorfer, 2009).

In the context of mega-sport events that are staged by a host city, the city's atmosphere represents all emotionally appealing environmental stimuli that are present during the hosting of the event. There is suggestive evidence that those who live in host cities perceive a "special" atmosphere; they get a different

perspective on their home city compared to how they have seen the city before the event. For example, one study reported that residents in a host city (compared to residents in a non-host city) were more involved in the event and watched more matches (Slabbert and Thomas, 2012). Furthermore, residents reported to experience a "party atmosphere" in the city and much more friendly people in the city during mega-sport events, such as the 2006 FIFA World Cup hosted in Germany (Ohmann et al., 2006). Brazil as a host city is special because "no other cultural phenomenon appears to represent the Brazilian Soul better than soccer" (Da Rosa Borges, Santos Silva and Da Silva Añaña, 2014, p. 27). The World Cup and soccer is present all along the city, therefore, a positive effect of event atmosphere on residents' quality of life can be expected. In what follows next, arguments are provided for why and how perceived atmosphere may influence how host city residents rate their quality of life, referring to the physical, social, psychological, and environmental domains.

First, city residents who perceive a positive atmosphere in the city during the event should benefit from positive **physical** subjectively measured health outcomes when a mega-sport event is hosted in their home city. Residents who absorb the atmosphere, such as the music played at the fan fests and the positive emotions spread by happy people celebrating the event, may experience their surroundings as a healing environment (McCaffrey, 2008), i.e. as a kind of distraction from normal life, which in turn can reduce physical pain (Buhle, Stevens, Friedman and Wager, 2012). Furthermore, a positive outlook may generate a more energetic life for the residents (Wann and Pierce, 2005).

This leads to an increase in physical health (WHOQOL question "Do you have enough energy for everyday life"). The first hypothesis of this thesis is:

H1: Perceived atmosphere increases the host city residents' change in the physical domain of quality of life from the beginning to the end of a mega-sport event that is hosted in their home city.

Second, residents who perceive a positive atmosphere should benefit from positive **social** health outcomes. Residents who like the atmosphere in the city may be more likely to interact with their family, friends, and colleagues as well as other residents and tourists from all over the world. Hall (1992, p. 69) argues that "shared experience," "expanding cultural perspectives," "building community pride and identity," and "increased community participation" are typical characteristics of mega-sport events; this of course in turn affects the social domain of health of individuals. Fredline (2005, p. 268) argues that these events provide many "opportunities for (…) community or family togetherness." Ohmann et al. (2006, p. 143) provide suggestive evidence that host city residents who appreciate the "party atmosphere" in the city are more likely to appreciate social relationships. Based on this evidence a positive impact on individuals social health is expected, because those who perceive the atmosphere positively engage in social gatherings and interact with fellow citizens leading to higher perceptions of social health. Therefore, the second hypothesis of this thesis is as follows:

H2: Perceived atmosphere increases residents' change in the social domain of quality of life from the beginning to the end of a mega-sport event that is hosted in their home city.

Third, residents who perceive a positive atmosphere should benefit from positive **psychological** health outcomes. Being at a fan fest, in a bar, or on the streets that have been closed down for traffic, while absorbing the party atmosphere in the city may result in happiness and joy. Residents may also tend to forget any life-related burdens or negative feelings if they perceive a positive atmosphere. The feeling of becoming part of festivities and other activities that take place in the city may make residents perceive that their quality of life increases, because otherwise, "people may become stuck in everyday routines (…). This leads to a search for activities that offer tension-excitement and emotional arousal" (Coakley and Donnelly, 2009, p. 336; see also Ohmann et al., 2006; Reis et al., 2010). It is clear that a positive perspective on a mega-sport event's atmosphere benefits residents' psychological health because by attending the event and watching the soccer matches residents experience an emotional arousal and a distraction from their everyday life. As a result, the third hypothesis of this thesis is:

H3: Perceived atmosphere increases residents' change in the psychological domain of quality of life from the beginning to the end of a mega-sport event that is hosted in their home city.

Lastly, residents who perceive a positive atmosphere should benefit from positive **environmental** health outcomes. Due to the number of attendees (visitors, athletes and spectators) during mega-sport events, infrastructure conditions, e.g., available hotel rooms, public transportation or restaurants, are improved to accommodate such a large number (Solberg and Preuss, 2007). Host cities are often required to invest in infrastructure, such as building sport stadiums and parks, improving public transportation, and improving security standards (Kaplanidou, 2012). Residents are most likely to profit from these investments if they perceive the atmosphere positively, that is, when they feel that:

- their physical environment provides some health opportunities for them (e.g., going for a walk in park),

- their environment is safer (e.g. feeling safer in public during the event because of the presence of policemen), and

- their mode of transportation is easier (e.g., taking the metro instead of cars or buses).

Those residents who perceive the atmosphere positively should also be less concerned about the negative consequences that the hosting of a mega-sport event may have, such as safety concerns, increase in prices, and traffic congestion (Preuss, 2007). This leads to the fourth hypothesis of this thesis:

H4: Perceived atmosphere increases residents' change in the environmental domain of quality of life from the beginning to the end of a mega-sport event that is hosted in their home city.

To summarize, host city residents who perceive the atmosphere in their home city during the event positively (vs. negatively) are expected to experience an increase in the physical, social, psychological, and environmental domains of quality of life during the course of the event (Hypotheses 1–4). No predictions are made about the sustainability until three month after the event of a potential increase in quality of life at high levels of perceived atmosphere because there is little theoretical or empirical support for such predictions. One could argue that perceived atmosphere keeps subjective health levels high because having good memories about the hosting of the event in the city may have positive effects on quality of life. But one could also argue that those who perceive a positive atmosphere will miss the experience that they had during the event and may then not be satisfied with going back to their day-to-day routine, and thus, rate their quality of life more negatively some time after the event.

Another variable that might impact residents quality of life is team identification, therefore arguments will be provided in the following subsection for why identification may affect the change in the four quality of life domains during the course of the hosting of the event (and after the event).

4.1.2 Relevance of team identification during mega-sport events

Team identification as a phenomenon in fans has already been researched for many years. Team identification is defined as "the extent to which a fan feels a psychological connection to a team" (Wann and Pierce, 2005, p. 117). The association between team identification and individuals' health was formulated for the first time in 1929, when Brill specified, "are you a fan? It is altogether to

be hoped, for your psychic health and well-being, that you are" (p. 429). Identified fans (i.e., hard core fans that follow their national teams) were found to differ from less identified fans (i.e., fans with a mild interest in their national teams). Differences will be described in the following.

During mega-sport events where national teams compete, a large number of spectators typically cheer for and identify with the national team. The interaction between spectators and the actions of the national team can lead to improved residents' health outcomes, which is especially true for highly identified spectators since the team they follow becomes a part of their social identity, as predicted by Social Identity Theory (Tajfel and Turner, 1979). Being a highly identified spectator has several consequences. First, economic consequences result from team identification - those have a higher attendance at games and a higher willingness to pay for tickets. They further buy the team sponsors' products, and purchase more team merchandise (Gau, James and Kim, 2009; Wakefield, 1995; Wann and Branscombe, 1993). These fans are more successive for the game outcomes, as it has been shown that they feel more satisfaction when game outcomes are positive (Madrigal, 1995). Second, if highly identified spectators gather, group emotions are formed and this creates a special feeling of togetherness. However, the consequences can also be of negative valence. Team identification has also been related to aggression. Some highly identified spectators may feel less control over their behavior at games compared to moderately and lowly identified spectators, resulting in aggressive behaviors (Dimmock and Grove, 2005).

While it is obvious that aggressive spectators may harm another's health, team identification has also been related to positive subjective health effects. Highly identified spectators have a strong feeling of belonging to a social group, which can further lead to benefits for an individuals' health. Wann and Pierce (2005) showed that social connections mediated the effect of team identification on social and psychological health. This effect was present for local fans but not for visiting fans, of distant teams (Wann and Pierce, 2005). However, in a more recent study, the authors report the direct effect of team identification on spectators' social and psychological health, while the mediating effect of social connections was not significant for a sample of high school students (mean age 16.2 years) attending a public mid-sized high school (Wann, Waddill, Brasher and Ladd, 2015). The study provides evidence for the influence of team identification on at least two of the four health dimensions (but not their change), although the evidence for this sample may not be transferable to a more representative sample and the context of mega-sport events in this research. Thus, evidence for the so-called Team Identification–Social Psychological Health Model is mixed (Wann, 2006), and the model has only been tested for local sports teams and not for national teams.

The reason why the **social** domain of quality of life increases by being identified with the national team can be explained with the Social Identity Theory, which was first described by Tajfel and Turner (1979). It examines the psychological processes that occur in individuals during (inter-)group events; people tend to categorize themselves and others into social groups, such as organizational membership, religious affiliation, and age cohorts (Tajfel and Turner, 1985). The

theory distinguishes between in-groups ("us") and out-groups ("them"). The act of individuals' belonging to a group creates a sense of social identity with other members of this group. Individuals identify with the members of their group (in-group), and also distinguish their group from other groups (out-group). Furthermore, the in-group is an important source of pride and self-esteem, creating a "we" feeling. The person then behaves on the basis of his personal, family or national "level of self" (Turner et al., 1987), which "makes group behavior possible" (Tajfel, 1982, p. 21).

Residents who are highly identified with their team share the experience of going to the stadium or watching the matches on television; in both contexts, they cheer for the team and celebrate. These behaviors are described as collectively adopted group behaviors increasing an individual's sense of belonging, which can lead to increased social health outcomes (Haslam et al., 2009).

Another reason for why those with higher social identity may rate their subjective health more positively is the fact that highly identified individuals receive more social support from their peers. According to House (1981), the support has four different facets. One facet is emotional support, which occurs when individuals share life experiences and feel emotionally close. In the case of a mega-sport event, spectators may share the experience made during the attendance of matches in the stadium or at public places such as fan fests for those who do not have tickets. Another facet is the instrumental support. This occurs when one person helps another person in need, such as when providing material assistance or help. The attendance of sport games of disabled persons, accompanied by a non-disabled person, is a good example for instrumental

support at mega-sport events. It can also be observed that persons invite each other to attend (or watch) games together, thus providing direct or indirect instrumental support. Another facet is informational support. Informational support can be given in the form of intangible help, such as advice, suggestion, and information that is useful to solve a problem. During a mega-sport event, this can be an important aspect because of infrastructural changes that occur due to the event hosting (Preuss, 2007). Individuals can seek help due to road blockings or changed opening hours. Also, highly identified fans can support each other when they have information about the best places where they can watch the matches, or how to purchase stadium tickets. Lastly, appraisal support is a facet of support. It aims to support a person with information needed to reflect his or her own behavior or situation, such as when feedback is provided. The four different facets of support can be observed in highly identified sport spectators and may thus contribute to subjective health, leading to the fifth hypothesis:

> *H5: Team identification of host city residents increases in the social domain of quality of life during the course of the event but not after the event.*

There is evidence for the positive impact of being a member of a social group on **physical** health outcomes. Support for this claim is provided by Reblin and Uchino (2008) who, in their review, found a positive impact of the social support that individuals have, broadly defined as the belonging to a social network or participation in a social network (such as nationality) on physical health. Another

study found that Canadians who strongly identify with their community had more positive (self-reported) overall health outcomes. This effect was present for individuals across gender, age, and socio-economic factors (Shields, 2008).

One study found that peoples' identification with a social group leads to a group-based self-esteem, which was found to be a major protective factor against chronic illness (Bailis, Chipperfield and Helgason, 2008). A literate review including 81 studies found that social support is beneficial for physiological processes in humans, such as the cardiovascular, endocrine, and immune systems functioning (Uchino, Cacioppo and Kiecolt-Glaser, 1996).

Another aspect in better physical health outcomes is that individuals have more informational support available (House, 1981). This aspect impacts their health-related information such as availability of health services and in turn health-seeking behaviors in the case of sickness (Cohen, 2004), leading to better demanded care or consulting a doctor in the case of sickness. In the context of the World Cup, highly identified fans go out and see friends, such as when watching the games together. Therefore, these individuals are expected to have more conversation in the case of help needed, leading to behavior beneficial for their health.

On the other hand, not having social support has been found to lead to negative health outcomes. Vanderhorst and McLaren (2005) report that older adults with fewer social resources had an increased risk to commit suicide. People involved in social conflict were found to have twice the risk to get a cold after exposure to a virus (Cohen, 1988). In the case of team identification, both positive and negative health outcomes can be expected. The group can be a resource for

information in the case of sickness. However, being member of a social group can also lead to sickness (e.g., infection) and unhealthy behaviors, such as drinking beer or eating unhealthy food when following sporting games. A recent review concluded that for adults with low levels of social integration, the relative risk for mortality was comparable to that of smoking and alcohol consumption (Holt-Lunstad, Smith and Layton, 2010). Due to the fact that individuals in host cities have increased social connections which is a proactive factor for physical health, positive health outcomes are expected for the residents. Those who are highly identified with the national team go out to watch the matches, interact with other fans and thus have a higher perception of support, which is beneficial for physical health outcomes. This leads to the sixth hypothesis:

H6: Team identification of host city residents increases the physical domain of quality of life during the course of the event but not after the event.

One argument for the positive relationship between social identity and positive **psychological** health outcomes is the stress-buffering hypothesis (Cohen and Wills, 1985). According to the hypothesis, individuals who have social support have a higher perceived ability to cope. Several authors showed that being part of a social group helped individuals to handle stressful situations (Uchino, Bowen, Carlisle and Birmingham, 2012; Uchino et al., 1996). These factors are direct indicators of an individual's psychological health. Vice versa, low social identity in individuals can have negative psychological health outcomes (Williams and Mohammed, 2009). Thus, those individuals who are highly

identified with the national team have a better stress resistance, e.g., when there is overcrowding in the city, leading to the following hypothesis:

> *H7: Team identification of host city residents increases the psychological domain of quality of life during the course of the event but not after the event.*

Environmental health includes the aspects surrounding an individual's life. Those highly identified may more easily accept their environmental surrounding, such as construction measures that are related to sporting events, because these individuals perceive that they more directly profit from it (e.g., when watching a game in the stadium). Lowly identified individuals are likely to be less satisfied with their built environment, e.g. construction measures that occur during the hosting of an event, such as road blockings, or traffic delays (Preuss, 2007), because they do not perceive the benefit of these environmental changes. Further, they cannot understand why highly identified fans gather in pubs or bars to watch matches together. Environmental psychology provides evidence for these statements, which focuses on the interplay between individuals and their surroundings. According to the congruence model, "a close fit between environmental characteristics and individual preferences and needs should contribute to a sense of well-being" (Kahana, 1982, p. 99). Thus, negative health outcomes can be expected for those who are annoyed by the construction sites or by other sport spectators being present at their city because they cannot adapt to the changes that occur. This leads to the following hypothesis:

H8: Team identification of host city residents increases the environmental domain of quality of life during the course of the event but not after the event.

4.2 Methods

4.2.1 Procedure and sample

The study took place in Rio de Janeiro, a host city of the 2014 FIFA World Cup Brazil. Data were collected during the first week of the World Cup (first wave; T1), during the week right after the World Cup (second wave; T2), and during a week three months after the end of the World Cup (third wave; T3). City residents of Rio de Janeiro who were at least 18 years old were invited to participate in the study by a Brazilian market research agency, which recruited their panel members to take part in the online survey.

In the survey, participants of the first wave were told that the study was about their wellbeing. After they gave their consent to participate, they filled in a questionnaire. At the end of the survey, participants were thanked for participation and invited to participate again one (or three) month(s) later. Quality of life was assessed in all three waves. In the second wave, participants were asked about their experience during the World Cup (including perceived atmosphere) in addition to the items assessed in the surveys before and after. In the third wave, participants were fully debriefed after they had filled out the survey.

4.2.2 Data analysis

Data sets were created using the Statistical Package for the Social Sciences (SPSS) version 23.0. Data modeling was performed with Mplus version 7.3 (Muthén and Muthén, 2007). The level of significance was set at $p < .05$, marginal significance was set at $p < .10$. Piecewise linear growth models were estimated via the full information maximum likelihood method (Enders and Bandalos, 2001). To examine the distribution of missing values, Little's (1988) missing completely at random (MCAR) test was conducted. In this sample, 24.2% of the participants had missing values ($M = .48$ missing values per participant referring to all variables across the three waves). Taking into account all variables of the survey across the three waves, the test was not significant, indicating that missing values are completely at random ($\chi^2 = 4,161.04$; df, 4,144; $p = .42$). Thus, missing values were imputed using full information maximum likelihood estimate. The piecewise linear growth models were used to analyze individual changes in the four quality of life domains over the three waves. Three different models were used. In a first step, only the change in quality of life over time was analyzed to receive information whether quality of life per se changes over time. In a second step, the effect of the contextual factors, perceived atmosphere and team identification, were included in separate models for hypothesis testing purposes. A third model was measured to analyze the impact of team identification and atmosphere, as simultaneous variables in the model. The first type of model yields information about the mean of the intercept across respondents (which in the present case is the mean quality of life at T2) and the variation in intercepts across respondents, the mean slope (increase or decrease

in quality of life) between T1 and T2 and the variation in this slope across respondents, as well as the mean slope between T2 and T3 and the variation in this slope across respondents. Thus, an intercept factor i and two slope factors s1 and s2 to model the means and variances of, and the covariances between the observed quality of life measures at the three points in time were specified. The loadings of the three quality of life measures on i are fixed at 1, and the loadings of the three quality of life measures on s1 are fixed at -1, 0, and 0 (indicating that the first wave took place one month before the end of the event hosting in T2). The loadings of the three quality of life measures on s2 are fixed at 0, 0, and 3 (indicating that the third wave took place three months after the end of the event hosting in T2). Using this coding, the means of i, s1, and s2 show the average quality of life at T2, the average change in quality of life between T1 and T2, and the average monthly change in quality of life between T2 and T3 across respondents, respectively. The variances of i, s1, and s2 show the variation in mean quality of life at T2, the variation in the change of quality of life between T1 and T2, and the variation in the monthly change of quality of life between T2 and T3 across respondents. Error variances at each time point were set to be equal, and the covariance between s1 and s2 was set to zero. The model is saturated and thus has zero degrees of freedom. Specifying the same model as before, atmosphere was included as a determinant of both the variation in intercepts and the variation in the two slopes. Both models will be described in more detail in the results section.

Second, the first type of model was used to analyze the change in team identification over the three waves. Then, a similar model as for quality of life and

atmosphere was specified using team identification. The difference in this model was that team identification was measured in all three waves. Therefore, this analysis aimed to investigate if team identification was a determinant of the variation in intercepts and the variation in the two slopes at the respective time points.

Third, the change in quality of life was analyzed in a combined model, including atmosphere and team identification simultaneously in the model. The Mplus codes of all analyses are in APPENDIX C.

4.3 Results

4.3.1 Change in quality of life

Table 7 presents the results of the model testing for the change in the four quality of life domains over time. The average quality of life for physical health (at T2) was 3.59 (with 1 indicating lowest and 5 indicating highest ratings), and there was significant variation in the scores across individuals (estimate = .233, $p <$ .001); the average monthly change between T1 to T2 was non-significant (estimate = -.001, p = .98; since the variance of s1 was negative and non-significant, it was set to zero), but negative and significant between T2 to T3 (estimate = -.027, p = .02; variation in s2: estimate = .005, p = .09).

The average quality of life for social health was 3.04, and there was significant variation in the scores across individuals (estimate = .546, $p <$ .001); the average monthly changes were not significant (s1: estimate = .023, p = .71 with significant variation in slope 1 [estimate = .352, $p <$ .001]; s2: estimate = .014, p

= .40; since the variance of s1 was negative and non-significant, it was set to zero).

The average quality of life for psychological health was 3.75, and there was significant variation in the scores across individuals (estimate = .252, $p < .001$); the average monthly change was not significant from T1 to T2 (estimate = -.042, $p = .18$; variation in s1: estimate = .048, $p = .10$), but negative and significant from T2 to T3 (estimate = -.043, $p < .01$; variation in s2: estimate = .011, $p = .001$).

The average quality of life for environmental health was 3.21, and there was significant variation in the scores across individuals (estimate = .335, $p < .001$); the average monthly changes were not significant (estimate = .058, $p = .12$ and estimate = -.007, $p = .57$) and the variations in the changes were non-significant (estimate = .034, $p = .36$ and estimate = .000, $p = .97$).

Table 7: Results of four piecewise linear growth models: variations in the four quality of life domains and their change over time
Source: Own table

	Estimate	Standard Error	Significance
Physical domain			
Mean of i	3.59	.037	< .001
Variance of i	.202	.034	< .001
Mean of s1	-.001	.032	.986
Variance of s1	-.067	.029	.022
Mean of s2	-.027	.012	.018
Variance of s2	.00	.00	-
Social domain			
Mean of i	3.04	.057	< .001
Variance of i	.546	.068	< .001
Mean of s1	.023	.062	.71
Variance of s1	.352	.088	< .001
Mean of s2	.014	.017	.400
Variance of s2	.00	.00	-
Psychological domain			
Mean of i	3.75	.035	< .001
Variance of i	.212	.032	< .001
Mean of s1	-.042	.029	.146
Variance of s1	-.001	.025	.961
Mean of s2	-.043	.011	< .001
Variance of s2	.00	.00	-
Environmental domain			
Mean of i	3.21	.042	< .001
Variance of i	.335	.045	< .001
Mean of s1	.058	.037	.114
Variance of s1	.034	.038	.358
Mean of s2	-.007	.012	.568
Variance of s2	.00	.00	.974

Notes. Slope 1 (s1) is the change between T1 and T2; slope 2 (s2) is the change between T2 and T3; intercept (i) indicates quality of life at T2.

4.3.2 Change in quality of life depending on perceived atmosphere

Since individuals' ratings of all the four quality of life domains varied significantly (i.e. all four variances in the intercept were significant), it is reasonable to assume that some background variables influenced these ratings (and their change over time, as some of the slopes also varied significantly). This analysis considers perceived atmosphere as one of the variables that may affect how individuals rate their quality of life after the event had ended (i.e., at T2) and how atmosphere affects the change in quality of life. Next perceived atmosphere was included in the four piecewise linear growth models to describe the changes in the four quality of life domains in individuals over time. The same model as before was specified, but atmosphere was included as a determinant of both the variation in intercepts and the variation in the two slopes. In addition, perceived atmosphere was modeled to influence both the intercept and the changes in the four quality of life domains over time (i.e., s1 and s2). The graphic representation of the structural model is shown in Figure 4, using the social domain as an example of one of the four quality of life domains.
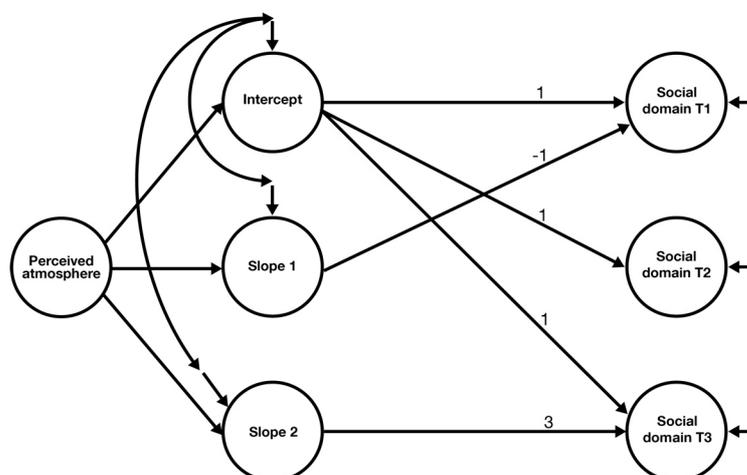
Figure 4: Piecewise linear growth model to assess the change in the social domain of quality of life over time depending on perceived atmosphere
Source: Own illustration

The path coefficients between perceived atmosphere and baseline scores for physical, social, psychological, and environmental health were significant for all four dimensions of quality of life, indicating variations in the intercept (i.e., the four quality of life domains at T2) depending on an individual's rating of atmosphere. The more positively participants perceived atmosphere during the event, the higher they rated the four quality of life domains, meaning their physical health (estimate = .213, $p < .001$), social health (estimate = .304, $p < .001$), psychological health (estimate = .250, $p < .001$), and environmental health (estimate = .303, $p < .001$) at T2 (Table 8).

More importantly, perceived atmosphere has a significant positive effect on the change in quality of life between T1 to T2 (slope 1). In other words, respondents who perceived a better atmosphere during the event also experienced a more positive change in quality of life between T1 and T2. This result holds true for all four quality of life domains: physical health (estimate = .085, $p = .02$), social health (estimate = .191, $p = .009$), and psychological health (estimate = .075, $p = .026$). There was marginal significance for environmental health (estimate = .077, $p = .07$), the results thus support Hypotheses 1–4 (Table 8). For physical health, perceived atmosphere has a significant negative effect on the change between T2 and T3, that is, those who perceived a more positive atmosphere during the event also experienced a greater decline in their physical quality of life between T2 and T3 (estimate = -.029, $p = .031$). For this change, no assumption was formulated in the hypothesis.

Table 8: Results of four piecewise linear growth models: influence of perceived atmosphere on the four quality of life domains and their change over time
Source: Own table

	Estimate	Standard Error	Significance	Hypothesis supported?
Physical domain				
Atmosphere → i	.213	.042	< .001	
Atmosphere → s1	.085	.038	.023	✓
Atmosphere → s2	-.029	.014	.037	
Social domain				
Atmosphere → i	.304	.067	< .001	
Atmosphere → s1	.191	.073	.009	✓
Atmosphere → s2	-.021	.022	.333	
Psychological domain				
Atmosphere → i	.250	.039	< .001	
Atmosphere → s1	.075	.034	.026	✓
Atmosphere → s2	-.007	.013	.586	
Environmental domain				
Atmosphere → i	.303	.047	< .001	
Atmosphere → s1	.077	.043	.070	(✓)
Atmosphere → s2	-.015	.014	.280	

Notes. Slope 1 (s1) is the change between T1 and T2; slope 2 (s2) is the change between T2 and T3; intercept (i) indicates quality of life at T2.

To examine the effect of perceived atmosphere on the change of quality of life between T1 and T2, which was significant for three domains and marginally significant for environmental health, (relatively) high (+1 SD) and (relatively) low (-1 SD) levels of perceived atmosphere were considered (M = 3.54 ± .85). Then the (predicted) growth model slopes between T1 and T2 for participants at levels of these selected values were described (Cohen, Cohen, West and Aiken, 2013).

At one standard deviation above the mean of perceived atmosphere, the change between T1 and T2 was significant positive for social health (estimate = .186, p = .04) and environmental health (estimate = .124, p = .017), but non-significant for both physical and psychological health (estimate = .072, p = .11 and estimate = .022, p = .59, respectively) (Figures 5-8). The positive signs are in line with the predictions. At one standard deviation below the mean of perceived atmosphere, the change between T1 and T2 was significant negative for physical and psychological health (estimate = -.106, p = .009 and estimate = -.074, p = .10; marginal significance), but not for social health (estimate = -.141, p = .11) and environmental health (estimate -.009, p = .867) (Figure 6, Figure 7). The negative signs are in line with the predictions.

For the physical health domain, the changes between T2 and T3 at different levels of perceived atmosphere are described, as there is a significant effect of perceived atmosphere on s2. At one standard deviation above the mean of perceived atmosphere, the change between T2 and T3 was negative (estimate = -.052, p = .001), while it was non-significant at one standard deviation below the mean (estimate = -.002, p = .895, Figure 5). The changes between T2 to T3 were non-significant for the other domains of quality of life.
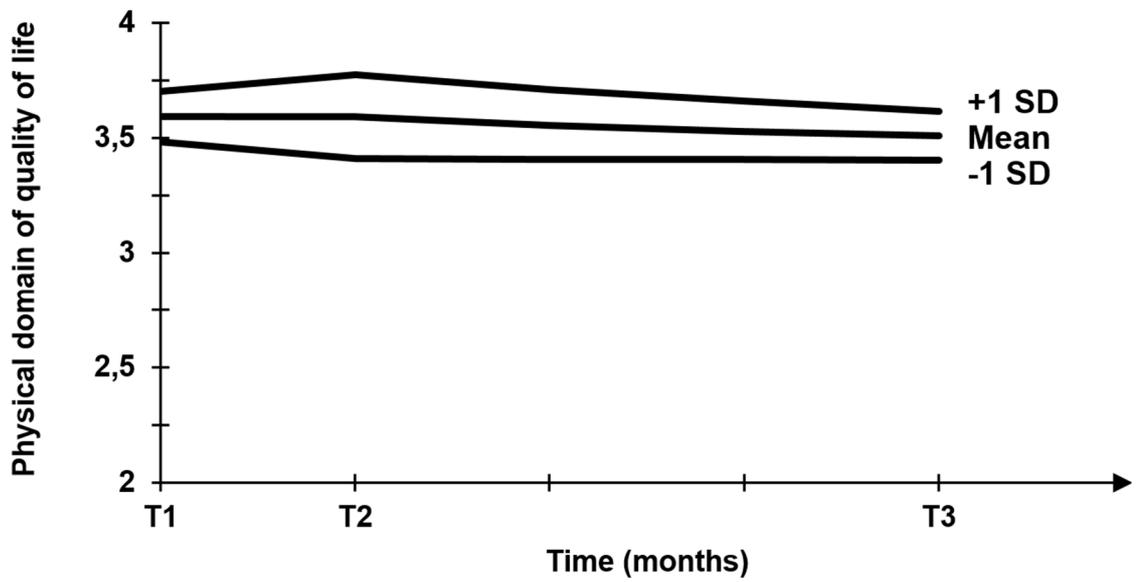
Figure 5: Change in the physical quality of life domain between T1 and T2 and between T2 and T3 at different levels of perceived atmosphere
Source: Own illustration
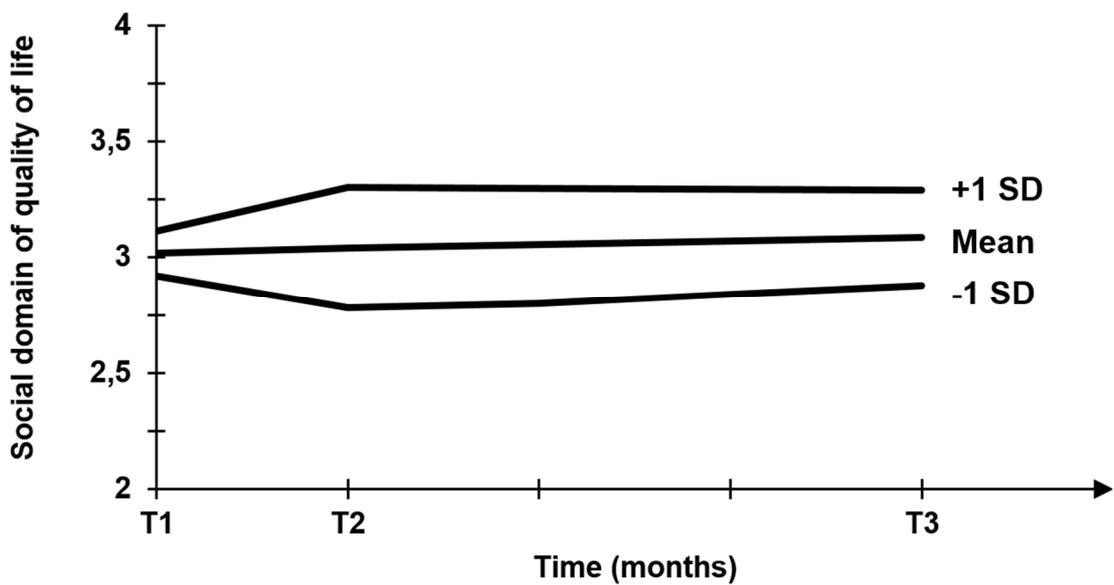
Figure 6: Change in the social quality of life domain between T1 and T2 and between T2 and T3 at different levels of perceived atmosphere
Source: Own illustration
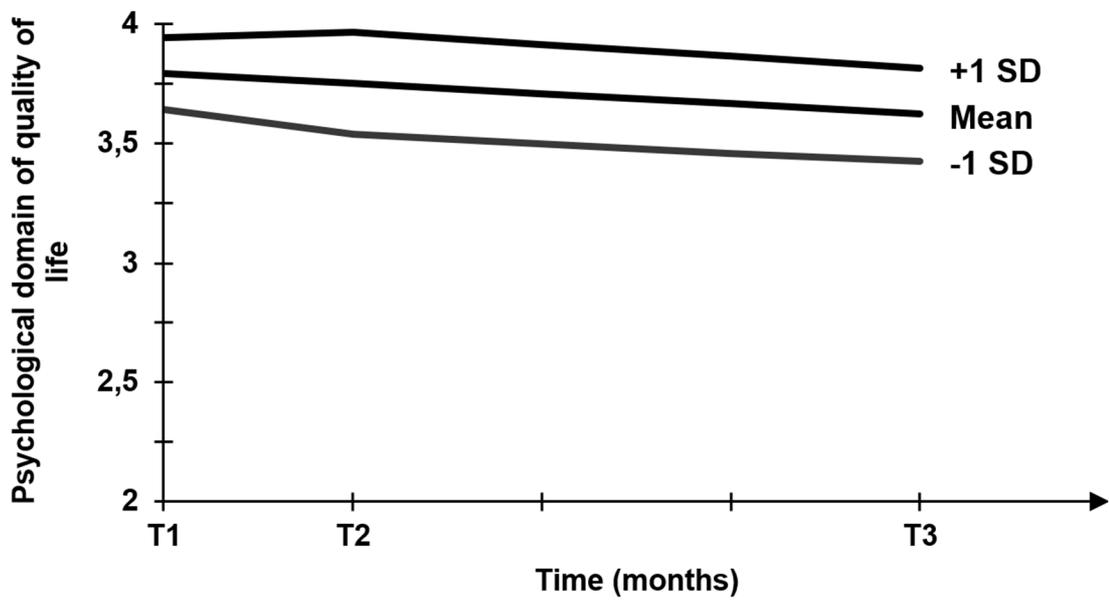
Figure 7: Change in the psychological quality of life domain between T1 and T2 and between T2 and T3 at different levels of perceived atmosphere
Source: Own illustration
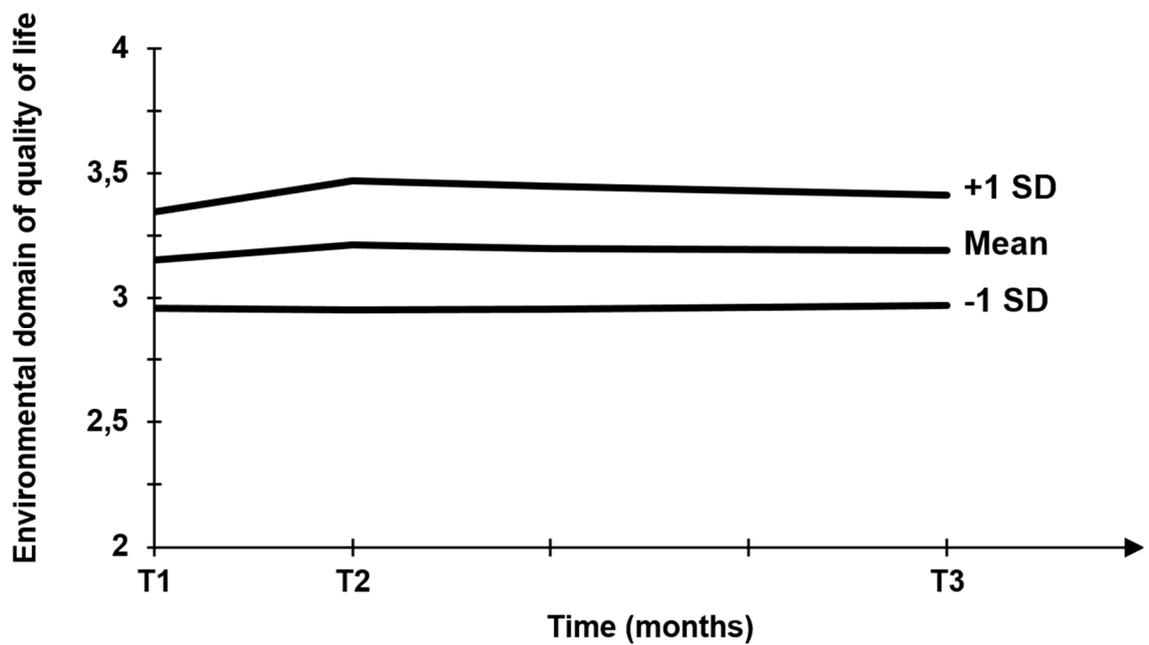
Figure 8: Change in the environmental quality of life domain between T1 and T2 and between T2 and T3 at different levels of perceived atmosphere
Source: Own illustration

4.3.3 Change in team identification

Table 9 presents the results of the model testing for the change in team identification over time. The average team identification (at T2) was 4.72 (with "1 indicating lowest team identification" and "7 indicating highest team identification"), and there was significant variation in the scores across individuals (estimate = 1.88, $p < .001$); the average change between T1 to T2 was non-significant (estimate = .090, $p = .228$). The average change between T2 to T3 however was significant and negative (estimate = -.081, $p = .003$), indicating that the team identification decreased after the event (between T2 to T3). The variation in the scores at T2 across individuals was non-significant (estimate = .033, $p = .103$). The results indicate that team identification remained constant from before to after the event, but slightly decreased after the event.

Table 9: Results of the piecewise linear growth models: variations in team identification and the change over time
Source: Own table

	Estimate	Standard Error	Significance
Team identification			
Mean of i	4.72	.098	< .001
Variance of i	1.88	.238	< .001
Mean of s1	.090	.074	.228
Variance of s1	-.060	.181	.740
Mean of s2	-.081	.027	.003
Variance of s2	.033	.020	.103

Notes. Slope 1 (s1) is the change between T1 and T2; slope 2 (s2) is the change between T2 and T3; intercept (i) indicates team identification at T2.

4.3.4 Change in quality of life depending on team identification

For the purpose of testing H5-H8 the effect of team identification on the four quality of life domains was analyzed in separate piecewise latent growth models. Team identification measured in T1 was included in the model, to account for causality. The path coefficients between team identification and baseline scores for physical, social, psychological, and environmental health were significant for all four dimensions of quality of life, indicating variations in the intercept (i.e., the four quality of life domains at T2) depending on an individual's rating of team identification (Table 10). The more participants identified with their team, the higher was the health outcome in T2 for physical health (estimate = .085, $p < .001$), social health (estimate = .180, $p < .001$), psychological health (estimate = .121, $p < .001$), and environmental health (estimate = .177, $p < .001$). The piecewise growth model did not reveal a significant effect of team identification on the change in quality of life between T1 to T2, and T2 to T3. Team identification had a non-significant negative effect on the change in quality of life between T1 to T2 for the physical domain (estimate = -1.803, $p = .598$), social domain (estimate = -2.756, $p = .489$), psychological domain (estimate = -.948, $p = .739$), and environmental domain (estimate = -.550, $p = .236$). A trend toward significance occurred for physical health between T2 to T3 (estimate = .222, $p = .078$) and psychological health (estimate = .308, $p = .059$). Namely, more identified respondents tend to experience a more positive change in the physical and psychological quality of life domains between T2 and T3. This change was non-significant for the social domain (estimate = .072, $p = .648$) and the

environmental domain (estimate = -.307, p = .452). Therefore, H5-H8 are not

supported.

Table 10: Results of four piecewise linear growth models: influence of team identification on the four quality of life domains and their change over time
Source: Own table

	Estimate	Standard Error	Significance	Hypothesis supported?
Physical domain				
Team identification T2 → i	.085	.026	< .001	
Team identification T1 → s1	-1.803	3.415	.598	✗
Team identification T3 → s2	.222	.126	.078	
Social domain				
Team identification T2 → i	.180	.038	< .001	
Team identification T1 → s1	-2.756	3.985	.489	✗
Team identification T3 → s2	.072	.157	.648	
Psychological domain				
Team identification T2 → i	.121	.025	< .001	
Team identification T1 → s1	-.948	2.843	.739	✗
Team identification T3 → s2	.308	.164	.059	
Environmental domain				
Team identification T2 → i	.177	.033	< .001	
Team identification T1 → s1	-.550	.464	.236	✗
Team identification T3 → s2	-.307	.408	.452	

The results indicate that the change in quality of life is not dependent on

residents' identification with the national team.

In the following analysis, both factors, perceived atmosphere and team

identification, are included simultaneously in the piecewise growth models to

analyze which of the factors are relevant for the change in the intercept. The

changes in team identification was not significant during the event, which is why the variable was included as a single measure variable in T1. Event atmosphere occurs during the event; therefore, the variable was only measured in T2.

4.3.5 Change in quality of life (combined model)

When including both constructs in the analysis, the results for team identification vanished while the effects only slightly changed for perceived atmosphere (see Table 11). The significant effect of team identification on the intercept became insignificant for all four domains: physical domain (estimate = .004, p = .867), social domain (estimate = .061, p = .119), psychological domain (estimate = .016, p = .485), and environmental domain (estimate = .046, p = .098). The effect of team identification on the change in quality of life was non-significant, as it was the case in the previous model, which only included team identification.

The effect of perceived atmosphere remained significant for all four domains for the intercept, as it was the case in the previous model, which only included atmosphere: physical domain (estimate = .210, p = < .001), social domain (estimate = .239, p = .002), psychological domain (estimate = .234, p = < .001), and environmental domain (estimate = .254, p = < .001). The effect on the change from T1 to T2 remained significant for three of the four domains: physical domain (estimate = .099, p = .025), psychological domain (estimate = .111, p = .005), and environmental domain (estimate = .111, p = .027), while the effect for the social domain changed to marginal significance (estimate = .162, p = .061). The negative change from T2 to T3 that was significant for the physical domain remained significant in this combined model (estimate = -.038, p = .024).

Table 11: Results of four piecewise linear growth models: influence of team identification and perceived atmosphere on the four quality of life domains and their change over time (combined model)
 Source: Own table

	Estimate	Standard Error	Significance
Physical domain			
Atmosphere → i	.210	.049	<.001
Team identification T1 → i	.004	.025	.867
Atmosphere → s1	.099	.044	.025
Team identification T1 → s1	-.013	.023	.551
Atmosphere → s2	-.038	.017	.024
Team identification T1 → s2	.008	.008	.350
Social domain			
Atmosphere → i	.239	.077	.002
Team identification T1 → i	.061	.039	.119
Atmosphere → s1	.162	.086	.061
Team identification T1 → s1	.028	.044	.516
Atmosphere → s2	-.028	.024	.241
Team identification T1 → s2	.006	.012	.620
Psychological domain			
Atmosphere → i	.234	.045	< .001
Team identification T1 → i	.016	.023	.485
Atmosphere → s1	.111	.040	.005
Team identification T1 → s1	-.034	.020	.095
Atmosphere → s2	-.014	.015	.345
Team identification T1 → s2	.006	.007	.391
Environmental domain			
Atmosphere → i	.254	.055	< .001
Team identification T1 → i	.046	.028	.098
Atmosphere → s1	.111	.050	.027
Team identification T1 → s1	-.031	.025	.226
Atmosphere → s2	-.017	.016	.292
Team identification T1 → s2	.002	.008	.841

4.4 Discussion

The purpose of this first analysis was to assess the changes in host city residents' quality of life (physical, social, psychological, and environmental health domains), and to analyze the change depending on both residents' perception of atmosphere in the city during the hosting of the event and team identification, until three months after the event.

The results of the first analysis showed that there was no overall change (from T1 to T2) in quality of life (i.e., independent from perceived atmosphere and team identification) during the event; a finding that is conform with another study that found little support for a hosting effect (Kavetsos and Szymanski, 2010).

A tendency for a significant decrease was found in both physical and psychological health from right after the event until three months after. As an explanation for the decrease in psychological health the expectation confirmation theory can be used, which originated in the field of consumer behavior to explain post-purchase satisfaction (Oliver, 1980). In the case of a mega-sport event, some residents might have a high expectation before the event because "there is a sense that something important is happening" (Chalip, 2006, p. 110). If the perceived performance (outcome of the event) is lower than an individual's expectation, there is a negative disconfirmation, leading to dissatisfaction. An unfulfilled expectation, e.g. if the outcome of the matches were not as expected, can then lead to a decrease in psychological health, because people's expectations are dissatisfied and thus they are disappointed which in turn generates negative feelings. The decrease in physical health may

result from the sudden disappearance of distractors from physical pain and stress relievers after the event has ended (Buhle et al., 2012).

On the one hand, the aim was to analyze the change in quality of life dependent on perceived atmosphere. As predicted by the behavioral model by Mehrabian and Russell (1974), the perception of a positive atmosphere increased quality of life during the course of the event (supporting H1-H4). The special atmosphere likely caused a positive emotional reaction (arousal and pleasure) in residents, which further affected their quality of life. The effect was not present any more after the event has ended (with one exception: physical health) because the special event atmosphere was not present any more. Those with high levels of perceived atmosphere (e.g. + 1 SD) appeared to profit most indicated by the increase in the social and environmental domain of quality of life. These individuals potentially attended the event, and thus interacted with other spectators and made use of the infrastructural changes. Those with low levels of perceived atmosphere (e.g. - 1 SD) had a decrease in the physical and psychological domain of quality of life, which can be traced back to the fact that the event hosting is perceived as a burden, leading to a higher perception of pain and suffering as a burden, as well as a higher stress level, e.g., due to road blockings, or traffic delays (Preuss, 2007).

On the other hand, the aim was to analyze the changes in team identification over the course of the event and to relate team identification and potential changes in team identification to residents' change in quality of life. Over the course of the World Cup, identification with the national team remained constant, but slightly decreased after the event. These results confirm previous

studies on individuals' identification with local teams, which report that identification with basketball and soccer teams remained constant during a session, but was about to change during the off-season (Wann, 1996). Thus, identification might have decreased due to the fact that the national team did not play as frequently as they did during the World Cup. Another reason is the reduced presence of the national team, as the national team is not playing in Brazil, i.e. for their own country, any more.

Social Identity Theory was used to explain the process of group formation in sport spectators and the positive effect of team identification on the changes of quality of life in the four domains. H5-H8 could not be supported because team identification was only significantly related to the construct of quality of life (during the event, in T2) but not to the change in quality of life.

In the combined model, the effect of perceived atmosphere remained significant, while the effect of team identification vanished, indicating that atmosphere is the relevant factor on the change of quality of life. The potential mechanism of environmental stimuli on individuals (such as perceived atmosphere) has already been explained in Mehrabian and Russell's (1974) environmental psychology behavioral model. For the relationship between team identification and quality of life, the team identification–social psychological health model provides first evidence, explaining the mechanism linking team identification to social and psychological health. However, for the context of the FIFA World Cup (where individuals identify on a national level), this model is only partially applicable. First, the model has a myopic perspective on an individual's health. An individual's health measured via the concept of quality of life, according to the

most recent definitions of the World Health Organization (WHO), includes four health domains (psychological, physical, social, and environmental health). Only the complete four dimensions (but not pre-selected single dimensions) are a valid indicator of the subjective evaluation of an individual's health status (World Health Organization, 2005). The WHO quality of life scale provides a valid and reliable measurement tool (WHOQOL Group, 1998).

Second, measuring the mediator as social connections gained through being a fan of a local team, has a specific focus on those connections only, which are made via the sport spectatorship. In the first study, the authors distinguished defined social connections if a person targeted a local or distant team (Wann and Pierce, 2005), indicating that those targeting the local team have a higher sense of social connections and camaraderie. In a second study, to provide evidence for the model, Wann and other authors measured social connection in relation to being a fan of the team instead of social connections in general those that are not related to being a fan of the team. An example of a question is: "How many of your closest friends do you feel are strong and involved fans of (name of team)?" (Wann et al., 2015). This can limit the view on a limited number of friends because only those relationships with close friends are considered, who are also highly identified. A person would be considered to not have close friends, although these close friends are just not highly identified fans. Thus, so far, the mechanism of team identification on health outcomes was only insufficiently studied.

As the effect of team identification on quality of life was not significant regarding both, the change and the intercept in the combined model, other factors might

be important in the relationship between team identification and quality of life that act as a mediator between these variables. Therefore, another analysis is conducted within this thesis, where the possible mechanism of team identification on all four quality of life domains via national identity as a mediator is analyzed.

4.5 Preliminary conclusion

As a preliminary conclusion, perceived atmosphere in the city during the hosting of mega-sport events enhances quality of life of host city residents at the time of when the event is hosted. This analysis contributes to the ongoing discussion (e.g. Gursoy, Chi, Ai and Chen, 2011; Kim et al., 2006; Kim and Petrick, 2005) on the short-term impact of hosting mega-sport events on individuals' health. This study found no increase in the four dimensions of quality of life per se during the hosting of the mega-sport event. The results also indicate that the physical and psychological quality of life domains may decrease after the event has ended.

To study team identification, it is interesting to look at the mechanism behind the relationship between team identification and the construct of quality of life. Therefore, the association between team identification and national identity (measured in T1) and quality of life (measured in T2) is analyzed. The theoretical background and the results of this analysis are presented and discussed in the next chapter.

5 EMPIRICAL PART: MEDIATED REGRESSION (ANALYSIS 2)

5.1 Theoretical background of the second analyses

To date, it remains unknown how team identification generates a positive subjective health effect for the city population of mega-sport event hosts. This is particularly true for mega events, where national teams compete. The competitions are often followed by spectators all over the country and make them feel proud of both their team and their nation, especially when the team is successful (Elling, Van Hilvoorde and Van Den Dool, 2014). "Belonging to a national form of life means being within a frame that offers meaning to people's choice between alternatives, thus enabling them to acquire an identity" (Margalit, 1997, p. 83). Thus, people with a high national identity have a feeling of belonging and a purpose in life, which according to a recent review can then lead to positive health outcomes and longevity (Cohen, Bavishi and Rozanski, 2016).

According to the Team Identification–Social Psychological Health Model (Wann, 2006), positive effects of team identification on subjective health result from an increase in the social connections that spectators make through their common interest in the team. Arguments for why this measure is not suitable in the context of a mega-sport event have been described before (Chapter 4.4). In short, the model does not represent the international character of these events. Thus, national identity is a better measure of the mediator within the context of this research. The association of team identification and national identity is especially true for residents of Brazil, because soccer is considered to define an individual's national identity (Da Rosa Borges et al., 2014). The aim of analysis

2 is therefore to investigate the explanatory mechanism behind the relationship between host city residents' identification with the national soccer team and their quality of life in the context of a mega-sport event. In particular, the expectation in this analysis is that national identity mediates the effects of team identification on the four dimensions of quality of life, extending previous attempts to provide explanations for why individuals may have higher subjective health ratings when mega-sport events that include their national team are hosted in their city. The second analysis contributes to the understanding of the short-term benefits of hosting a mega-sport event from the perspective of host city residents. The line of argumentation is that host city residents' identification with their national team increases national identity, and national identity increases quality of life. Thus, national identity should mediate the relationship between team identification and quality of life. Figure 9 shows the conceptual model. In what follows, the theoretical background for this analysis is presented.
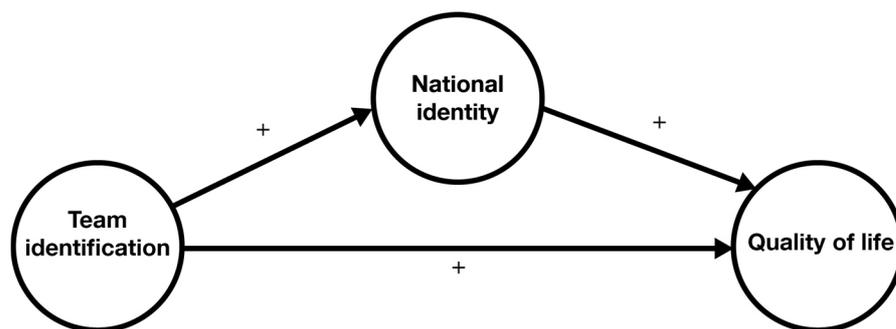
Figure 9: The relationship between identification with the national team, national identity, and quality of life
Source: Own illustration

5.1.1 Relationship between team identification and national identity

Identification with a national team should positively relate to national identity, because of collectively made experiences of the spectators that entail similar behaviors and practices, such communal cheering and celebration, a collectively adopted group behavior, as described in the Social Identity Theory (Tajfel and Turner, 1979) – defined in detail earlier in this thesis (Chapter 4). As explained in Social Identity Theory, being part of a spectator community becomes part of the social identity of an individual, and the identity likely relates not only to the sports team that is supported, but also to how individuals feel about one's own nation and identify with it. National identity can be defined as "a subjective or internalized sense of belonging to the nation" (Huddy and Khatib, 2007, p. 65). Both Nation Building Theory and Social Identity Theory support these claims. Nation Building Theory describes the processes of nation building, meaning the national integration and union that result in the creation of a modern nation-state. Nation-states are those "whose people share a strong linguistic, religious, and symbolic identity" (Tilly, 1990, p. 3). High team identification can contribute to this process, such as: wearing the national team's shirts strengthens the symbolic identity; waving (or merely watching others wave) the national flag; singing or hearing the national anthem during matches or at the award ceremony; and seeing athletes wear the national uniform during a sporting game. In sports, individuals can categorize themselves into groups according to their favorite national teams. This group is the in-group, while fans of other teams are out-groups. Group behaviors and practices may then reinforce team identification and lead to an increase in national identity. Others often want to

become part of the social group of highly identified spectators and also display their identification with the team, such as wearing the team's jerseys or waving the team's/country's flag (Wann and Branscombe, 1993), which in the case of the national team can lead to an increased national identity. During the 2010 World Cup in South Africa "residents perceived the World Cup as promoting a sense of community and pride and bringing people together in celebration" (Gibson et al., 2014, p. 119), this sense of community can also be measured as an increase in national identity, supporting arguments that team identification leads to an increase in national identity.

5.1.2 Impact on the four quality of life domains

Arguments for the association between team identification and quality of life were already discussed in chapter 4. In this analysis, individuals with high national identity are expected to rate their quality of life more positively compared with individuals whose national identity is low. In the following arguments for why national identity could mediate the relationship between team identification and quality of life are presented. In this case, the identity refers to the whole country because when national teams compete at mega-sport events, the team represents the whole nation (not only a regional or small community). Thus, national identity is an important form of identity building that gives individual sense, and therefore the study expects an impact on all four quality of life dimensions. The arguments provided above lead to the general hypothesis, which is stated as follows: *The higher the host city residents' identification with*

the national team, the higher their national identity, which acts as a mediator on quality of life during the hosting of a mega-sport event.

Since quality of life is a four-dimensional concept (WHOQOL Group, 1998), in what follows next, arguments for the application of the above-mentioned mediation chain on all four dimensions are provided: physical, social, psychological, and environmental health.

National identity can lead to positive **physical** health outcomes, because individuals care for and support each other in the wider in-group. It has been shown that individuals put greater weight on the welfare of someone who is part of one's group than of someone who is an outsider (Vaughan and Hogg, 2005). Being member of the social group of nationality can have an impact on physical health outcomes. Similar to the processes in individuals with high team identification, having a high feeling of nation identity gives individuals the perception of belonging to a social network and a secure feeling of having social support available when needed, aspects that can lead to better physical health outcomes (Reblin and Uchino, 2008). Hypothesis 9 therefore states the following:

> *H9: National identity mediates the relationship between host city residents' identification with the national team and the physical domain of quality of life assessed at the end of the event.*

Effects on **social** health are expected because being highly identified with a social group is associated with having more social contact and receiving more support (House, 1981). As described in Social Identity Theory (Tajfel and Turner,

1979) individuals form groups, in this case individuals of Brazilian nationality. These individuals can be expected to have the feeling of being part of a social group and to experience more supported when they need it. This is directly linked to social health outcomes, leading to hypothesis 10:

H10: National identity mediates the relationship between host city residents' identification with the national team and the social domain of quality of life assessed at the end of the event.

As an argument for the **psychological** domain, the stress-buffering hypothesis does not only apply to team identification but also to national identity (Cohen and Wills, 1985). Individuals who get social support from their fellow citizens have a higher perceived ability to cope. Being member of a social group such as nationality can increase psychological health. Several authors showed that being part of a social group such as nationality helped individuals to handle stressful situations (Uchino et al., 2012; Uchino et al., 1996). Based on the arguments provided above, H11 is derived:

H11: National identity mediates the relationship between host city residents' identification with the national team and the psychological domain of quality of life assessed at the end of the event.

Environmental health includes the aspects surrounding an individual's life. Those with a high national identity will accept the built environment and construction measures that occur due to the hosting of an event more easily because they feel as a part of the nation and also as part of the city. In the case

of Rio de Janeiro, those with a high national identity feel as cariocas (residents of Rio de Janeiro) and thus they welcome the infrastructural changes, and potential negative impacts such as road blockings, or traffic delays, that occur in the city because they have a strong feeling of belonging to the to the nation (Huddy and Khatib, 2007) and also to the city of Rio de Janeiro. These individuals might even identify with the new built environment that was created in the context of the event hosting, e.g., sports facilities, or green spaces. This leads to the last hypothesis:

> *H12: National identity mediates the relationship between host city residents' identification with the national team and the environmental domain of quality of life assessed at the end of the event.*

5.2 Methodology

5.2.1 Procedure and sample

Data of the first two waves were used for the analysis (T1 and T2). The analysis of the two waves instead of three waves increases the sample size to 361 participants. The data collection has been described before (Chapter 3.2). The data that were considered for analysis 2 include the following: during the first week of the World Cup (first wave; T1), and during the week right after the World Cup (second wave; T2).

Three hundred sixty one participants (56.1% male; mean age of 43.1 years ($\pm$ 13.2); median $= 42.0$) took part in the study. Again, the sample was slightly older and included slightly more men compared to the general population of Rio de

Janeiro (IBGE 2010). Participants had been living in Rio de Janeiro for a mean of 38.2 years (± 15.7). Most of them had earned a bachelor's degree or a higher degree (73.8%) and 22.1% had completed the equivalent of a high school degree, indicating a well-educated sample. The majority lived in a household that consists of two people or more (90.8%). The majority of participants in this sample were either married (59.7%) or single (25.6%).

5.2.2 Data analysis

Statistical analyses were performed using SPSS version 23.0 and Mplus. To test for mediation, regression-based mediation analyses were conducted in SPSS (Hayes, 2013). To test the significance of the indirect effect bootstrapping procedures in PROCESS were used (model 4, Preacher and Hayes, 2008, p. 445). Confirmatory factor analysis (CFA) was computed with Mplus version 7.3 (Muthén and Muthén, 2007). Statistical significance was inferred at a value of p < .05.

5.3 Results

In this analysis, the aim was to investigate if the effect of sport spectators' identification with the national team (independent variable) on the four health domains (dependent variable) could be explained by national identity (mediator). Discriminant validity is a prerequisite for conducting a mediation analysis (MacKenzie et al., 2011). Therefore, it was tested if team identification and national identity were discriminant from each other. The results of a CFA

including all items from both scales showed that the fit of the measurement model was satisfactory, with relative chi square = 1.95, CFI = .973, TLI = .965, SRMR = .035, and RMSEA = .051 (Hu and Bentler, 1999). The factor loadings of the CFA specify the variance in each item that is accounted for by the scale (Lattin, Carroll and Green, 2003). Factor loadings of the team identification scale ranged between .67 and .93 with one exception (item 6 with .47); factor loadings of the national identity scale were between .70 and .84. AVEs exceeded the acceptable threshold of .5 (Hair, Black, Babin and Anderson, 2010), indicating convergent validity. The correlation between the two scales was moderate (r = .534, Cohen, 1988). Discriminant validity was present as the AVEs were larger than the squared correlations between the constructs (Table 12). Thus, we can conclude that the scales are discriminant and unrelated from each other and measure different constructs.

Table 12: AVEs and squared correlations between the latent variables
Source: Own table

	Team identification	National identity
Team identification	(.595)	.285
National identity	.285	(.622)

Note: AVE is in the diagonal are displayed in parentheses

The results of the mediation analyses are shown in Table 13. The analyses revealed a significant influence of team identification on the mediator, physical b = .31, SE = 0.03, p < .001, social b = .31, SE = 0.03, p < .001, psychological,

and environmental b = .31, SE = 0.03, p < .001 (the path is identical for all four domains). In addition, the mediator was significantly related to all the four health domains, physical, social, psychological, and environmental b = .11, SE = 0.04, p < .05, indicating that the mediator had a positive effect on the four health domains (proving evidence for Hypothesis 9-12).

The indirect effect of team identification on the health outcome through the mediator national identity was significant as indicated by the 95% bootstrap confidence intervals using 1,000 bootstrap estimations. Results for the four domains were positive for the physical domain b = .04, bootstrap confidence interval ranging from .0176 to .0693 (supporting H9); social domain b = .06, bootstrap confidence interval ranging from .0447 to .0934 (supporting H10); psychological domain b = .07, bootstrap confidence interval ranging from .0362, .0962 (supporting H11); and environmental domain b = .03, bootstrap confidence interval ranging from .0028 to .0579 (supporting H12). The analyses thus revealed a significant mediation effect for all four health domains, providing evidence for hypotheses H9 - H12.[1]

The direct effect of team identification on health outcomes remained significant for three of the four health domains, physical domain b = .06, SE = 0.02, p < .05; social domain b = .09, SE = 0.03, p = < .001; and environmental domain b = .10,

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[1] Because atmosphere had a significant effect on the intercept in the combined model, the variable was included as a covariate in the mediated regression. The indirect effect remained significant for three of the four domains: physical b = .03, with a bootstrap confidence interval ranging from .0112 to .0602, social b = .05, with a bootstrap confidence interval ranging from .0243 to .0880, psychological domain b = .05, with a bootstrap confidence interval ranging from .0326 to .0847. For the environmental domain the bootstrap interval included the zero b = .02, with a bootstrap confidence interval ranging from -.0008 to .0466, being close to significance.

SE = 0.26, p < .001.   For the psychological domain the direct effect was not significant *b* = .03, SE = 0.21, p > .05.

Table 13: Results of the mediation model: The relationship between team identification and quality of life via national identity
Source: Own table

	PHYSICAL		SOCIAL		PSYCHO-LOGICAL		ENVIRON-MENTAL	
	B	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*
a	.31 **	.027	.31 **	.027	.31 **	.027	.31 **	.027
b	.13 **	.039	.20 **	.047	.22 **	.036	.11 *	.043
c	.06 *	.023	.09 **	.028	.03	.021	.10 **	.026
Indirect effect	.04	.013	.06	.015	.07	.012	.03	.014
Bootstrap confidence interval	[.0176, .0693]		[.0447, .0934]		[.0362, .0962]		[.0028, .0579]	

*Notes: *p < .05, **p < .001, a = effect of team identification on national identity, b = effect of national identity on quality of life domain, c = effect of national identity on quality of life domain*

5.4 Discussion

In this second analysis, the aim was to analyze the indirect effect of team identification on the quality of life domains, via the identification with the national team. The results of the study showed that this indirect effect was significant meaning that national identity mediated the relationship between team identification and quality of life, referring to the four dimensions (psychological, physical, social, and environmental health). As predicted, this effect was significant using arguments from both Nation Building and Social Identity Theory. Team identification increased national identity, which in turn increased the four quality of life domains assessed at the end of the 2014 World Cup.

The findings contribute to the literature on team identification and quality of life (Wann, 2006). The results extend the Team Identification-Social Psychological Health Model by using another mediator that applies to the context of international matches, national identity, and by using the multidimensional approach to measure subjective health on the four dimensions.

Although the direct effect was not present for the psychological domain in this analysis, the findings could generally be extended for the physical and environmental domain of quality of life, when comparing with a previously conducted study. In that study, the author found a direct effect of team identification on the social-psychological health domain (Wann, 2006). The occurrence of a direct and indirect effect in this study can be traced back to the fact that the mediating variable accounts for some, but not all variance of the relationship between team identification and quality of life. To conclude, there may also be some other important factors, mediating the relationship between team identification and quality of life, which cannot be explained by national identity, and which affect an individual's quality of life. Examples of these are a team's wins and losses (Stieger et al., 2015), socioeconomic conditions (Nichols, Stitt and Giacopassi, 2002) or residents' general support as well as negative and positive emotions towards the event hosting beyond those associated with a positive event atmosphere (Gursoy et al., 2015).

6 GENERAL DISCUSSION

6.1 Overview of the findings

The aim of the thesis was to investigate the impact of hosting a mega-sport event on the quality of life in host city residents and to identify population groups that profit from hosting the event. The context of this research was the 2014 FIFA World Cup. In particular, the thesis aimed to investigate if residents' health changes during the hosting of a mega-sport event (first research question). The WHO defines health as a multidimensional construct (World Health Organization, 1946). Based on this definition, health was conceptualized using the WHOQOL questionnaire, which measures quality of life, an individual's subjective evaluation of the health status, conceptualized in four dimensions. Results of the first analysis demonstrate that without considering contextual factors, hosting of the 2014 FIFA World Cup did not directly lead to an increase in quality of life during the event.

The thesis also looked at a second research question: Do contextual factors matter in the change of residents' quality of life? To answer the second research question, the effects of two contextual factors were analyzed: event atmosphere and residents' identification with the national team. The results demonstrated that only event atmosphere had an effect on the change in residents' quality of life, which supports H1-H4, H5-H8 were rejected. When comparing residents with high and low levels of perceived atmosphere, those with a high level of perceived atmosphere (e.g. + 1 SD) profited most in the social and environmental domain of quality of life from the beginning to the end of the event, although these residents also had a significant decrease in physical health three month

after the event. In those with a low level of perceived atmosphere (e.g. - 1 SD), the physical and psychological domain of quality of life even decreased from the beginning to the end of the event.

Team identification had a significant effect on the construct of quality of life, but not on the change in quality of life. When simultaneously including both factors in the piecewise growth model, the effect of perceived atmosphere remained significant while team identification became non-significant. Thus, when comparing the effect of team identification and perceived atmosphere on quality of life (but not change in quality of life), the latter has a greater impact. Looking at changes in quality of life, the population group of residents who perceives the event atmosphere positively was identified to profit from hosting the event, with positive changes in quality of life from the beginning to the end of the event. Team identification however did not impact the change in quality of life (rejecting H5-H8).

To find an explanation for why team identification may not directly relate to quality of life, a second analysis was conducted, using the data of the first and second wave of the data collection. The aim was to investigate the consequences of team identification in more detail. As predicted by Social Identity Theory and Nation Building Theory, national identity mediated the relationship between team identification and the four dimensions of quality of life. Those with high team identification had a higher national identity, which in turn lead to higher outcomes in the four quality of life domains at the end of the World Cup. The hypotheses concerning the relationship between team

identification, national identity and quality of life were therefore supported (H9-H12).

6.2 Theoretical implications

This thesis contributes to the literature in several ways. First, the results revealed no increase in the four dimensions of quality of life per se during the hosting of the mega-sport event until three months after the event. This finding is in line with two systematic reviews that conclude that there is little support for a generally positive health impact of the hosting of mega-sport events on the host population (Mahtani et al., 2013; McCartney et al., 2010b). Another study investigated a single measure of quality of life not as the dependent variable but as a mediating variable in the relationship between perceived event impacts and residents' event support three months before and eight months after the event. The authors reported the means of quality of life before and after the event and found no significant difference in the means of quality of life (Kaplanidou et al., 2013).

Other studies used only one dimension of health as the dependent variable, e.g. secondary data on physical health, and found some evidence for a positive effect of hosting (e.g. Carroll et al., 2002; Lee et al., 2007) or single item measures, but, found little support for a hosting effect (Kavetsos and Szymanski, 2010). Comparability of studies that investigate the health outcomes from hosting an event is limited, due to the inconsistent measures of the outcome variable and the different periods of measurement in previous studies. So far, this research can be a contribution to the investigation of intangible outcomes of event

hosting. Because it uses a multidimensional approach to health (derived from the WHO's holistic approach to health), it may serve as a paradigm for studies on the health outcomes of mega-sport events in future research. The measurement in frequent waves including the period during the event is important, as the findings of this research show that the effects of the factors on quality of life change over time, underlining the importance of repeated measurements.

Second, this research included two contextual factors, and identified perceived event atmosphere during the hosting of the event as a driver of positive subjectively measured health effects when mega-sport events are hosted. To date, most research in the field of public health has focused on the impacts of the hosting of mega events on health related dependent variables without taking into account contextual factors (Lee et al., 2007; Wilbert-Lampen et al., 2008). In this research, perceived atmosphere in the city was identified as a predictor of a positive change in physical, social, and psychological domain of quality of life, as well as the environmental domain of quality of life (marginal significance for the latter). Thus, the perception of an exciting atmosphere does not only lead to a more positive perception of sports services that are provided inside stadiums (Koenigstorfer, Groeppel-Klein and Kunkel, 2010), but also influences the host population's quality of life during the hosting of mega-sport events. Another contribution concerns the application of the scale in the context of a mega-sport event because it was originally developed for the stadium context (Uhrich and Benkenstein, 2010). By including a contextual factor in the analysis

this research helps explain the previous non-significant main effects of event hosting on quality of life (Kaplanidou et al., 2013).

The second contextual factor team identification did not have a significant impact on the change in quality of life, but only a significant impact on the construct of quality of life when analyzed in a separate model. The effect vanished in the combined model, which is why the mediation of national identity was tested. This findings of this model are comparable with previous research, where a positive association of team identification with two domains of the construct of quality of life were reported (Wann, 2006). However the relationship has only been tested in the context of smaller sport events, e.g., local basketball teams competing on a regional level (Wann and Pierce, 2005); therefore, another contribution of this research is the application of the team identification measure within the context of a mega-sport event.

The findings reported by Stieger et al. (2015) that identification depends on the success of the team could not be tested in this analysis because information on an individual's perception of the success of the Brazil team was not included in the analyses and questions on quality of life refer to an individual's perception within the last two week. Therefore, it is not possible to evaluate if the team's performance is perceived as a success or not.

Third, the findings contribute to Social Identity Theory and Nation Building Theory. This research provides evidence that identification with the national team is associated with an individual's national identity, which is positively related to residents' quality of life. Those being identified with their team experienced a higher connection to their fellow fans and increased identity with

their nation e.g., caused by an increase in the symbolic identity, which according to Margalit (1997) gives a special meaning to the individual. This provides evidence for the postulated benefits of in-group formation in sport spectators of the national team.

The research is also a contribution to environmental psychology as the study demonstrated that environmental stimuli triggered by the event hosting act to cause a positive emotional response, e.g., arousal, which has a positive impact on individuals' four domains of quality of life.

Fourth, this research makes several methodological contributions. The most important aspect is the use of a growth model that allows the assessment of an individual's changes over time, surveying the same sample repeatedly. Previously conducted studies used secondary data and repeated cross-sectional study designs (see APPENDIX A). Repeated cross-sectional studies have the disadvantage of not assessing causal relationship between two variables (Carlson and Morrison, 2009). Longitudinal studies allow researchers to assess changes within individuals, which was done in this thesis (with three waves). In this sense, this research contributes to the understanding of quality of life over the course of a mega-sport event hosting.

6.3 Managerial implications

Based on the results of this research, event organizers, public health practitioners, and city representatives can work together to promote a stimulating and arousing event atmosphere throughout the city, as it can increase residents' quality of life during the course of hosting mega-sport events. The factors that have been identified as part of a health impact assessment in the context of mega-sport events (McCartney et al., 2010a) may also be evaluated against the background of their contribution to the event's atmosphere. Furthermore, quality of life for residents of communities with low levels of communication and mobilization capacities may use the leveraging effect of hosting mega events to increase subjective health (Jung, Bigman-Galimore and Viswanath, 2014).

Event organizers are recommended to promote a positive event atmosphere throughout the city, as it can increase residents' quality of life during the hosting of mega-sport events. Given the positive influence of atmosphere and team identification on host city residents' quality of life during the hosting of mega-sport events, event organizers should promote a positive event atmosphere and try to increase residents' national identity.

One way to do this would be to: decorate streets; allow people to gather at public places (e.g., closing streets for parties); have other stakeholders become involved in the event (e.g., sports clubs); and connect the mega-sport event to other cultural happenings, such as music and dance performances.

Event organizers should also promote residents' identification with their national team and ensure that residents have a high national identity, which in turn results

in health benefits. The identification can be increased by improving the awareness for the national team, by, e.g., hanging up flags, bringing the team closer to the residents, presenting the personal background of the players (place of birth, age, family or hobbies). If residents find similarities between players and their own (family) background, residents perceive that these national players are authentic and just can therefore find a common ground, i.e. that they are average members of the Brazilian society. Another aspect of how national identification through team identification could also be strengthened is providing live television coverage of matches on public screens and fan fests, so that residents are able to follow their national team. This can promote the formation of in-groups, who distance themselves from the out-groups, such as fans of other national teams. Another possibility is showing and reporting about the national team in public before and after the live television coverage. Another idea related to the fan fest is a live animation on a stage to physical activity during the warming phase of the players. Having the resulting health benefits for residents helps event organizers find arguments for hosting of mega-sport events. This could change the public attitude that exists against hosting mega-sport events.

Another recommendation for event organizers is to combat the (not hypothesized) decrease in quality of life regarding physical and psychological health that was observed from the end of the event until three months later. Potential means to keep physical and psychological health levels high are to organize societal gatherings that remind participants of the mega event, such as mini soccer matches or other gatherings/events at the location where the FIFA fan fest took place. Another idea would be an intervention at this mini-event that

reminds residents of the benefits of participating in physical activity themselves. This intervention would enclose the promotion of health with fun activities during these mini-events, in which spectators participate to gain awareness of the advantages of physical activity. An example of these fun activities from another mega-sport event is a campaign to promote recycling, organized by a major sponsor of the 2012 Olympic Games in London. Another way is to communicate the success of the national team. If the perceived outcome of the played matches meets or exceeds the expectations of the event outcome, the disconfirmation is positive, which avoids an individual's disappointment, which in turn can lead to a reduced decrease in psychological health.

One recommendation for sports federations is to implement regulations that are essential for the creation of a positive event atmosphere. An important aspect is that residents feel safe in their city. Thus, the regulation should be formulated for a good ratio of security in the stadium and for the fan fest, otherwise people may decide to better not attend the event or even to leave the city or country for the period of the event. However, if there is too much security, people might feel intimidated.

Another regulation concerns a good infrastructure with sufficient kiosks for water supply, toilets, and enough garbage bins. If it is too dirty, or if basic needs are not fulfilled, residents would not feel comfortable and thus, could not enjoy the event. Another idea is the provision of shuttle busses, which connect the geographically segregated event clusters. By traveling with the official busses, spectators can travel from one event location to the other in a safe manner, and

could also be entertained on the bus. This is a good mean to make spectators feel safe and to keep event atmosphere high.

Public health practitioners, e.g., those working at the federal, state, and local health departments, can contribute to the creation of a positive event atmosphere by being present at crowded places such as the fan fast, and being available when help is needed. In the case of the World Cup the presence of international organizations such as Doctors Without Borders, or those working for the Red Cross, as well as local doctors and medical staff can contribute to people's perception of feeling safe and having medical support when needed. They can further recommend policies focused on funding the built environment of the local community (for example). Likewise, the government of the host country should support these investments, as benefits in residents' quality of life lead back to economic benefits for the government.

Lastly, the tourism industry and local organizations, e.g., local restaurants, bars, hotels or travel and sports agencies, can also contribute to the positive event atmosphere. Team identification could be increased by: decorating the facilities with the national flag, printing silhouettes or installing cardboard cutouts of the players. Promoting a special experience with music before and after the live television coverage in bars and restaurants around the city can only help business, as well as contribute to the event atmosphere, as the population celebrate the event on the street, together as a nation.

6.4 Limitations and future research

As any empirical study, the present research has some limitations. First, one may argue that trait and state constructs are theoretically different (Steyer, Ferring and Schmitt, 1992). Some items of the WHOQOL-BREF instrument reflect a state nature of quality of life. They might be less useful for measuring changes in quality of life that can be attributed to the hosting of a mega-sport event. For example, residents' agreement with items referring to medical treatments, and access to health services cannot be assumed to change because of hosting the 2014 World Cup. It can rather be traced back to personal circumstances that reflect the state of a person (and not as a result of the hosting of a mega-sport event), such as when a person is in need for medication after a surgery or when a person is in search for access to health care services after having moved his or her home.

Second, the use of online surveys has some advantages (e.g., cost effectiveness, low social desirability bias, access to panel members) but does also has some disadvantages. Certain populations, especially highly educated people and frequent Internet users, are more likely to participate in online surveys compared to other survey techniques (Kraut et al., 2004; Reips, 2002). In this research, the sample was well-educated and is not representative for the host city population of Rio de Janeiro. Thus, future studies may try to reach less-educated population groups (e.g., people residing in favelas) in order to provide evidence whether the same relationships hold true for them.

Third, some limitation concerns the methodology of the research. The data could have been collected in more waves to look more closely at the non-linear

relationship of the change in quality of life that was found in this research. In general, more waves increase the power of the study (Muthén and Curran, 1997). Since the hosting of mega-sport events changes the infrastructure and the legacy of mega-sport events has been reported to span generations (Preuss, 2007), further longitudinal research is needed, covering longer time periods than four months, because population effect can be expected to occur from the day of the candidature announcement (Sim, 2012). Preuss (2007, p. 13) also talks about the "pregnancy effect", meaning due to event preparations potential impacts occur already one year before hosting. Intangible legacy, such as for quality of life, may be at highest levels when the host population makes full use of the infrastructure (Kaplanidou, 2012), such as when the Olympic park in London has been rebuilt for the purpose of community use (which was about one year after the Olympic Games had ended), arguing that environmental health may be affected in the long-run by the hosting of a mega-sport event (HM Government, 2014). To consider this, longitudinal studies are needed that include measurement points over several years.

As an extension of this research, additional data on event atmosphere and determinants of quality of life could be collected via a qualitative or mixed method approach, to investigate the individual perceptions of the event atmosphere.

Fourth, the performance of the national team may influence quality of life on a short-term basis. Although some researchers found that the success of the home team has little effect (Kavetsos and Szymanski, 2010), future studies may measure quality of life right after wins and losses of the home team and relate

these variables to the variables that were included in this model (Stieger et al., 2015). The use of mobile devices to measure quality of life repeatedly and right after wins and losses may be helpful in obtaining such data.

Fifth, the data were collected in only one of 12 host cities, the city, in which the championship final was hosted. One may argue that the excitement was highest in Rio de Janeiro due to the fact that it hosted the final game which actually included the national Brazilian team. Thus, future studies should attempt to identify if the results are replicable for all host cities (and contrast them with non-host cities) to provide evidence for the generalizability of the results, and its boundary conditions (Slabbert and Thomas, 2012). Another possibility is the application within other contexts.

Sixth, future research could study means to keep team identification constantly high, which might be of interest for event organizers as it influences an individual's probability to attend future games (Matsuoka, Chelladurai and Harada, 2003). Because team identification did not have an impact on the change in quality of life, it is unclear if identification with the team leads to a group formation, as predicted in Social Identity Theory. To contribute to the theory, future studies could investigate the processes of group formation and behavior in highly identified sport spectators and if these differ from lowly identified spectators.

Lastly, event atmosphere was measured at one time point only. The measurement of event atmosphere should not only be during the event, but also before and after the event. Using the same methodology as it was used for quality of life and team identification the change in perceived atmosphere could

be compared during the event hosting with the score of perceived atmosphere in the city measured before the event. Items on atmosphere would relate to the city, especially in Rio de Janeiro where events take place on a regular basis one could argue that people perceive the atmosphere as already exciting, e.g., due to the annual Carnival, or samba dancers around the city. Furthermore, Rio de Janeiro is considered as one of the sensational cities because of "its distinctive series of domed mountains and beaches" (Speake, 2007). Overall, the city provides residents with numerous opportunities for leisure activities such as cinemas and theatres, or clubs of all types, compared to smaller cities — even lower social classes can enjoy such leisure activities as well (Gilbert, 1996). It has been shown that the hosting of festivals and special events in a city lead to an increased city image (Liu and Chen, 2007). A qualitative study revealed that Brazilians from rural areas migrated to the city because "they wanted something exciting and unknown, namely the big city, where the action (movimento) was" (Perlman, 2005, p. 13). This statement and aforementioned aspects indicate that even without hosting a mega event the atmosphere in the city of Rio de Janeiro, as operationalized in this study, might generally be high, without an actual event taking place. The city could be considered as an exciting city even without hosting a mega event, which makes the change in the perceived atmosphere of interest for future research. Such research would provide arguments for if there was an increase in perceived atmosphere that can be attributed not to the event hosting but to factors that are inherent to the city and its marketing efforts. Future studies may further investigate if the effects are replicable or different for other events that are hosted in the city of Rio de Janeiro, e.g., the

multidisciplinary sport event (such as the 2016 Olympic Games) or the annual Carnival event.

7 CONCLUSIONS

This thesis aimed to 1) investigate the impact of hosting mega-sport events on residents' health and 2) identity potential influencing factors on residents' health: event atmosphere and identification with the national team. The hosting of the 2014 FIFA World Cup did not increase quality of life per se, but did affect residents who evaluated the atmosphere in the city during the event positively. Being highly identified with the national team was associated with higher national identity and in consequence better quality of life. Thus, special emphasis should be placed on creating a unique event atmosphere and residents' national identity.

Research so far only investigated single dimensions of health or used secondary health data. Future research should consider using the multidimensional approach of health to account for the holistic approach according to the WHO. The literature on impact of mega-sport events is heterogenic in terms of the outcome variables and period of measurement. Using a standardized and multidimensional measurement for health outcomes could help get a more consistent evaluation of the health impact of mega-sport events.

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APPENDIX A: TABLES

Requirement of an event categorization by size

Size	Visitor attractiveness Number of tickets sold	Media reach (USD) Value of broadcast rights	Cost (USD) Total cost	Transformation Capital investment
XXL (3 points)	>3 million	>2 billion	>10 billion	>10 billion
XL (2 points)	>1 million	>1 billion	>5 billion	>5 billion
L (1 points)	>0.5 million	>0.1 billion	>1 billion	>1 billion

Giga event 11–12 points total
Mega event 7–10 points total
Major event 1–6 points total

Note. Events get points in each of the four dimension. Based on the points, events can be categorized as major-, mega-, or giga-events.

Source: Illustration based on Müller (2015)

Published primary studies on the health impact of mega-sport events

Author	Content	Study design	Event	Outcome
Studies on physical health outcomes				
Carroll et al., 2002	Relative risk for hospital admission for myocardial infarction during event days	Secondary data	1998 World Cup in France	Myocardial infarction
Friedman et al., 2001	Hospital admission for childhood asthma	Secondary data	1996 OG in Atlanta	Childhood asthma
Indig et al., 2003	Hospital admission for illicit drug use	Secondary data	2000 OG in Sydney	Illicit drug use
Lee et al., 2007	Hospital admission for childhood asthma	Secondary data	2002 Asian Games in Busan	Childhood asthma
Simon et al., 1998	Demand for pediatric health services in the host city	Secondary data	1996 OG in Atlanta	Demand for pediatric health services
Wilbert-Lampen et al., 2008	Changes in the relationship between determinants of health or health-related aspects and health outcomes	Secondary data	2006 FIFA World Cup in Germany	Cardiovascular events
Witte et al., 2000	Relative risk to die from a heart disease for Dutch men and women when they followed the Netherlands' national soccer team during the event	Secondary data	1996 European soccer championship	Coronary heart disease and stroke
Repeat cross-sectional studies				
Gibson et al., 2014	Change in psychic income and social capital among residents	3 month before, 8 month after	2010 FIFA World Cup in South Africa	Psychic income and social capital
Kaplanidou et al., 2013	Changes in the relationship between determinants of health or health-related aspects and health outcomes	3 months before, 8 months after	2010 FIFA World Cup in South Africa	Quality of life, determinants
Kavetsos et al., 2010	The impact of hosting a mega-sport event on residents' satisfaction with life in twelve European countries that hosted different mega-sport events over the course of thirty years (from 1974 until 2004)	Eurobarometer Survey Series data	Mega-sport events over the course of thirty years (from 1974 until 2004)	Satisfaction with life

Author	Content	Study design	Event	Outcome
Stieger et al., 2015	The use of mobile devices to measure quality of life repeatedly and right after wins and losses	Beginning of the event	2014 FIFA World Cup in Brazil	Subjective well-being
Waitt, 2003	Change in enthusiasm, enhanced community spirit and feelings of belonging for the Olympic Games increased over two years	2 years before and during the event	2000 OG in Sydney	Social impact
Included studies on perceived impact				
Gursoy and Kendall, 2006	Perceived benefits and costs; support for the event	Pre /during and three months after	2002 OG in Salt Lake City	Perceived benefits and costs
Kim et al., 2006	Residents' perception of benefits of mega-sport events. e.g. crime, traffic congestion, and prices	1-2 month before, 3 month after	2002 FIFA World Cup in Japan	Perceived benefits
Kim and Petrick, 2005	Impacts and changes in perceptions over time (3 waves) and differences by age and gender	Prior to, and 3 month after the event	2002 FIFA World Cup in Japan	Perceived (tourism) impact
Ohmann et al., 2006	Perceived social impacts by residents of Munich	Repeat cross-sectional study	2006 FIFA World Cup in Germany	Perceived social impacts
Slabbert and Thomas, 2012	Involvement and watched matches in residents in a host city (compared to residents in a non-host city)	1 month before	2010 FIFA World Cup in South Africa	Perceived impact in community

Notes. OG = Olympic Games.

APPENDIX B: QUESTIONNAIRES

Questionnaire for the empirical study T1

Hello and thank you very much for your participation. In the following survey, we would like to ask you about your perspective on the Brazilian society as well as your well-being.

Your answers will be treated strictly confidential and you will remain anonymous throughout the study. The survey will contribute to a better understanding of how Brazilians feel and what they think about their current situation of their country. The study serves scientific purposes only.

What is your age?

- Years: _____

Do you live in Rio de Janeiro?

- Yes
- No

First, we have some questions concerning your attitude towards the Brazilian country in general. Please indicate the degree to which you agree with the following statements.

How important is being Brazilian to you?

- Not at all important
- Low
- Moderately
- Very
- Extremely

To what extent do you see yourself as a typical Brazilian?
How well does the term Brazilian describe you?

- Not at all
- Slightly
- Moderately
- Very much
- Completely

When talking about Brazil how often do you say "we" instead of "they"?

- Never
- Rarely
- Sometimes
- Often
- Always

How important is being a Brazilian to you, where 0 is not at all important and 10 is the most important thing in your life? *Response option 1-10*

We have some questions about where you live: your neighborhood or village, your town or city, your county, and so on.

How good does it make you feel when you see the Brazilian flag flying?

How good does it make you feel when you hear the Brazilian national anthem?

- Unhappy
- Slightly happy
- Somewhat happy
- Happy
- Very happy

People should work hard to move Brazil in a positive direction.

If I criticize Brazil, I do so out of love of country.

I oppose some Brazilian policies because I care about my country and want to improve it.

I express my attachment to Brazil by supporting efforts at positive change.

I support Brazil's leaders even if I disagree with their actions.

People who do not wholeheartedly support Brazil should live elsewhere.

For the most part, people who protest and demonstrate against Brazilian policy are good, upstanding, intelligent people.

Brazil is virtually always right.

I support Brazilian policies for the very reason that they are the policies of my country.

There is too much criticism of Brazil in the world, and we as its citizens should not criticize it.

I believe that Brazilian policies are almost always the morally correct ones.

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

How close do you feel to Brazil?

- Not close
- Little close
- Moderately close
- Close
- Very close

The following questions ask you to say how good or satisfied you have felt about various aspects of your life over the last two weeks.

How satisfied were you…

…with your sleep?

…with your ability to perform your daily living activities?

…with your capacity for work?

…with yourself?

…with your personal relationships?

…with your sex life?
…with the support you get from your friends?
…with the conditions of your living place?
…with your access to health services?
…with your transport?
- Very dissatisfied
- Dissatisfied
- Neither satisfied or dissatisfied
- Satisfied
- Very satisfied

Following we are interested in your well being, please think of the last two weeks.
How well are you able to get around?
How would you rate your quality of life?
- Very poor
- Poor
- Neither poor nor good
- Good
- Very good

How satisfied are you with your health?
- Very dissatisfied
- Dissatisfied
- Neither satisfied or dissatisfied
- Satisfied
- Very satisfied

Please answer the following questions about your relationships with others.
Do you feel happy about your relationship with your family members?
- Very unhappy
- Unhappy
- Neither happy nor unhappy
- Happy
- Very happy

How alone do you feel in your life?
- Not at all
- Slightly
- Moderately
- Very much
- Extremely

Do you get the kind of support from others that you need?
To what extent can you count on your friends when you need them?
- Not at all
- A little
- Moderately
- Mostly
- Completely

Please explain your relationship with others. How satisfied are you with…

... with your personal relationships (friends, parents, acquaintances, colleagues)?
... with the support you get from your family?
... with the support you get from your friends?
... with your ability to provide for or support others?
- Very dissatisfied
- Dissatisfied
- Neither satisfied or dissatisfied
- Satisfied
- Very satisfied

In what follows next, we are interested in your perspective on intercultural communication. Please indicate the degree to which you agree or disagree with each of the statements.

I can be as sociable as I want to be when interacting with people from different cultures.
I enjoy interacting with people from different cultures.
I think people from other cultures are narrow-minded.
I find it very hard to talk in front of people from different cultures.
I avoid those situations where I will have to deal with culturally-distinct persons.
I don't like to be with people from different cultures.
I often show my culturally-distinct counterpart my understanding through verbal or nonverbal cues.
I have a feeling of enjoyment towards differences between my culturally-distinct counterpart and me.
I respect the values of people from different cultures.
I am pretty sure of myself in interacting with people from different cultures.
I always know what to say when interacting with people from different cultures.
I get upset easily when interacting with people from different cultures.
I feel confident when interacting with people from different cultures.
I tend to wait before forming an impression of culturally-distinct counterparts.
I often get discouraged when I am with people from different cultures.
- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

In what follows next, we are interested in your perspective on intercultural communication. Please indicate the degree to which you agree or disagree with each of the statements.

I think my culture is better than other cultures.

I often give positive responses to my culturally-different counterpart during our interaction.

I would not accept the opinions of people from different cultures.

I am sensitive to my culturally-distinct counterpart's subtle meanings during our interaction.

I am open-minded to people from different cultures.

I am very observant when interacting with people from different cultures.

I often feel useless when interacting with people from different cultures.

I respect the ways people from different cultures behave.

I try to obtain as much information as I can when interacting with people from different cultures.

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

Next, we are interested in your relationships with tourists during the last two weeks.

How many tourists have you seen in your community during the past two weeks?
_____

How much contact have you made with tourists during the past two weeks?

_____

As In what comes next, we are interested in your everyday life during the last two weeks. Please rate how much you have experienced certain things in the last two weeks.

To what extent do you feel that physical pain prevents you from doing what you need to do?

How much do you need any medical treatment to function in your daily life?

How much do you enjoy life?

To what extent do you feel your life to be meaningful?

How well are you able to concentrate?

How safe do you feel in your daily life?

How healthy is your physical environment?

- Never
- Seldom
- Quite often
- Very often
- Always

The following questions ask about how completely you experience or were able to do certain things in the last two weeks.

Do you have enough energy for everyday life?

Are you able to accept your bodily appearance?

Have you enough money to meet your needs?

How available to you is the information that you need in your day-to-day life?

To what extent do you have the opportunity for leisure activities?

- Not at all
- A little
- Moderately
- Mostly
- Completely

How often do you have negative feelings such as blue mood, despair, anxiety, depression?

- Never
- Seldom
- Quite often
- Very often
- Always

To what extent do you have the opportunity for leisure activities (as provided by the environment, in which you live)?

…In public indoor sports facilities

…In public outdoors sports facilities

…In public parks

…In sports clubs

- Not at all
- A little
- Moderately
- Mostly
- Completely

How important is sports in your community?

- Not important
- A little important
- Moderately important
- Very important
- Extremely important

The questions in this scale ask you about your feelings and thoughts during the last two weeks. In each case, you will be asked to indicate by circling how often you felt or thought a certain way during the past two weeks,

How often have you…

…been upset because of something that happened unexpectedly?

…felt that you were unable to control the important things in your life?

…felt nervous and stressed?

…felt confident about your ability to handle your personal problems?

…felt that things were going your way?

…found that you could not cope with all the things that you had to do?

…been able to control irritations in your life?

…felt that you were on top of things?

…been angered because of things that were outside of your control?

…felt difficulties were piling up so high that you could not overcome them?

- Never
- Almost Never
- Sometimes
- Fairly Often
- Very Often

Next, we are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person.

Think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport. Think only about those physical activities that you did for at least 10 minutes at a time.

During the **last 7 days**, on how many days did you do physical activities?

How much time did you usually spend doing physical activities on one of those days?

    Days per week: _____
    Hours per day: _____ and minutes per day: _____
    No physical activities

Think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

During the last 7 days, on how many days did you walk for at least 10 minutes at a time?

    Days per week: _____
    Hours per day: _____ and minutes per day: _____
    No walking

During the last 7 days, how much time did you spend sitting on a week day? Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

    Hours per day: _____ and minutes per day: _____

How much are you interested in soccer? Please indicate the degree to which you agree with the following statements.

…I consider myself as a fan of soccer.

…I love to follow the game of soccer.

...I am a huge fan of soccer in general.

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

How much are you interested in the FIFA World Cup? Please indicate the degree to which you agree with the following statements.

…I enjoy the highest excitement during the FIFA World Cup.

…I always follow the FIFA World Cup.

…I am highly interested in the FIFA World Cup.

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

Please indicate your perspective on Brazil as the host country of the FIFA World Cup. The fact that Brazil is hosting the FIFA World Cup is … *Response option 1-7*

- Positive - negative
- Good - bad
- Favorable – unfavorable

Please indicate the degree to which you agree with the following statements.

I fully support that Brazil is hosting the FIFA World Cup.

I give my very best to contribute to the success of hosting the FIFA World Cup in Brazil.

I try to help have the FIFA World Cup in Brazil become a success story.

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

Which of the following teams is your favorite team? _____

How important to you is it that the team wins?

Not important – Very important, *Response option 1-7*

How strongly do you see yourself as a fan of the team?
Not at all a fan – Very much a fan, *Response option 1-7*

How strongly do your friends see you as a fan of the team?
Not at all a fan – Very much a fan, *Response option 1-7*
How important is being a fan of the team to you?
Not important - Very important, *Response option 1-7*

How much do you dislike the team's greatest rivals?
Do not dislike – Dislike very much, *Response option 1-7*

How often did you display the team's name or insignia at your place of work, where you live, on your vehicle, or on your clothing?
  • Never - Always, *Response option 1-7*

Please indicate your perspective on Brazil as the host country of the FIFA World Cup. The fact that Brazil is hosting the FIFA World Cup is … *Response option 1-7*
  • Positive - negative
  • Good - bad
  • Favorable – unfavorable

Please answer the questions concerning your demographic background.
What is your gender?
  • Female
  • Male

What is your monthly household gross income in R$?
  R$:
  No answer

How many people live in your household?
(Counting siblings or other relatives who live in the same house)
  Persons: _____
  I live alone

What is the highest educational level that you have attained?
  • Less than one year of education
  • Elementary school (9 years)
  • High School degree (plus three years)
  • Bachelor's degree
  • Master's degree

What is your civil status?
- Single
- Married
- Divorced
- In partnership
- Widowed

For how long do you live in Rio de Janeiro?

Years: _____

Month: _____

To anonymously track your data in the following research, we would like to ask you to create a personal code. This code consists of the first three letters of your mother's name and the last three letters of his last name.

Thanks a lot for your participation! Your participation is a great contribution to our research! Within the following month, we will contact you and ask you whether you participate again. We would highly appreciate it if you participated again.

Do you have any comments?

Questionnaire for the empirical study T2

Hello and thank you again for your participation. In the following survey, we would like to ask you about your opinion and perspective on the Brazilian society as well as your well-being, quality of life and the World Cup.
Your answers will be treated strictly confidential and you will remain anonymous throughout the study. The survey will contribute to a better understanding of how Brazilians feel and what they think about their current situation of their country. The study serves scientific purposes only.

In what follows next, we are interested in your perspective on intercultural communication. Please indicate the degree to which you agree or disagree with each of the statements.

I can be as sociable as I want to be when interacting with people from different cultures.
I enjoy interacting with people from different cultures.
I think people from other cultures are narrow-minded.
I find it very hard to talk in front of people from different cultures.
I avoid those situations where I will have to deal with culturally-distinct persons.
I don't like to be with people from different cultures.
I often show my culturally-distinct counterpart my understanding through verbal or nonverbal cues.
I have a feeling of enjoyment towards differences between my culturally-distinct counterpart and me.
I respect the values of people from different cultures.
I am pretty sure of myself in interacting with people from different cultures.
I always know what to say when interacting with people from different cultures.
I get upset easily when interacting with people from different cultures.
I feel confident when interacting with people from different cultures.
I tend to wait before forming an impression of culturally-distinct counterparts.
I often get discouraged when I am with people from different cultures.

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

In what follows next, we are interested in your perspective on intercultural communication. Please indicate the degree to which you agree or disagree with each of the statements.
I think my culture is better than other cultures.
I often give positive responses to my culturally-different counterpart during our interaction.
I would not accept the opinions of people from different cultures.

I am sensitive to my culturally-distinct counterpart's subtle meanings during our interaction.
I am open-minded to people from different cultures.
I am very observant when interacting with people from different cultures.
I often feel useless when interacting with people from different cultures.
I respect the ways people from different cultures behave.
I try to obtain as much information as I can when interacting with people from different cultures.

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

Next, we are interested in your relationships with tourists during the last two weeks.
How many tourists have you seen in your community during the past two weeks?
_____

How much contact have you made with tourists during the past two weeks?

_____

Please explain your relationship with others how satisfied are you …
... with your personal relationships (friends, parents, acquaintances, colleagues)?
... with the support you get from your family?
... with the support you get from your friends?
... with your ability to provide for or support others?
- Very dissatisfied
- Dissatisfied
- Neither satisfied or dissatisfied
- Satisfied
- Very satisfied

How important is being Brazilian to you?
- Not at all important
- Low
- Moderately
- Very
- Extremely

To what extent do you see yourself as a typical Brazilian?
How well does the term Brazilian describe you?
- Not at all
- Slightly
- Moderately
- Very much
- Completely

When talking about Brazil how often do you say "we" instead of "they"?
- Never
- Rarely
- Sometimes
- Often
- Always

How important is being a Brazilian to you, where 0 is not at all important and 10 is

the most important thing in your life? *Response option 1-10*

We have some questions about where you live: your neighborhood or village, your town or city, your county, and so on.
How good does it make you feel when you see the Brazilian flag flying?
How good does it make you feel when you hear the Brazilian national anthem?
- Unhappy
- Slightly happy
- Somewhat happy
- Happy
- Very happy

People should work hard to move Brazil in a positive direction.
If I criticize Brazil, I do so out of love of country.
I oppose some Brazilian policies because I care about my country and want to improve it.
I express my attachment to Brazil by supporting efforts at positive change.
I support Brazil's leaders even if I disagree with their actions.
People who do not wholeheartedly support Brazil should live elsewhere.
For the most part, people who protest and demonstrate against Brazilian policy are good, upstanding, intelligent people.
Brazil is virtually always right.
I support Brazilian policies for the very reason that they are the policies of my country.
There is too much criticism of Brazil in the world, and we as its citizens should not criticize it.
I believe that Brazilian policies are almost always the morally correct ones.

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

How close do you feel to Brazil?

- Not close
- Little close
- Moderately close
- Close
- Very close

Following we are interested in your well being, please think of the time during the World Cup.
How well are you able to get around?
How would you rate your quality of life?
- Very poor
- Poor
- Neither poor nor good
- Good
- Very good

How satisfied are you with your health?
- Very dissatisfied
- Dissatisfied
- Neither satisfied or dissatisfied
- Satisfied
- Very satisfied

Please answer the following questions about your relationships with others.
Do you feel happy about your relationship with your family members?
- Very unhappy
- Unhappy
- Neither happy nor unhappy
- Happy
- Very happy

How alone do you feel in your life?
- Not at all
- Slightly
- Moderately
- Very much
- Extremely

Do you get the kind of support from others that you need?
To what extent can you count on your friends when you need them?
- Not at all
- A little
- Moderately
- Mostly
- Completely

As in what comes next, we are interested in your everyday life during the World Cup. Please rate how much you have experienced certain things during the World Cup.
To what extent do you feel that physical pain prevents you from doing what you need to do?
How much do you need any medical treatment to function in your daily life?
How much do you enjoy life?
To what extent do you feel your life to be meaningful?
How well are you able to concentrate?
How safe do you feel in your daily life?
How healthy is your physical environment?
- Never
- Seldom
- Quite often
- Very often
- Always

The following questions ask about how completely you experience or were able to do certain things in the last two weeks (during the World Cup).
Do you have enough energy for everyday life?
Are you able to accept your bodily appearance?
Have you enough money to meet your needs?
How available to you is the information that you need in your day-to-day life?
To what extent do you have the opportunity for leisure activities?
- Not at all
- A little
- Moderately
- Mostly
- Completely

How often do you have negative feelings such as blue mood, despair, anxiety, depression?
- Never
- Seldom
- Quite often
- Very often
- Always

To what extent do you have the opportunity for leisure activities (as provided by the environment, in which you live)?

…In public indoor sports facilities
…In public outdoors sports facilities
…In public parks
…In sports clubs

- Not at all
- A little
- Moderately
- Mostly
- Completely

The following questions ask you to say how good or satisfied you have felt about various aspects of your life during the World Cup (approximately the last 2 weeks).

How satisfied are you…
…with your sleep?
…with your ability to perform your daily living activities?
…with your capacity for work?
…with yourself?
…with your personal relationships?
…with your sex life?
…with the support you get from your friends?
…with the conditions of your living place?
…with your access to health services?
…with your transport?

- Very dissatisfied
- Dissatisfied
- Neither satisfied or dissatisfied
- Satisfied
- Very satisfied

The questions in this scale ask you about your feelings and thoughts during the last two weeks. During the World Cup (approximately the last 2 weeks), -
How often have you…
…been upset because of something that happened unexpectedly?
…felt that you were unable to control the important things in your life?
…felt nervous and stressed?
…felt confident about your ability to handle your personal problems?
…felt that things were going your way?
…found that you could not cope with all the things that you had to do?
…been able to control irritations in your life?
…felt that you were on top of things?
…been angered because of things that were outside of your control?
…felt difficulties were piling up so high that you could not overcome them?

- Never
- Almost Never
- Sometimes
- Fairly Often
- Very Often

How did you experience the atmosphere during the World Cup? During the World Cup…

There are amazing vibes.

There is tremendous enthusiasm.

You experience really strong emotions.

The atmosphere gives you goose bumps.

There's a real thrill in the air.

You get caught up in the general euphoria.

You get a real high.

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

If you think back of the World Cup, how often have you experienced the following emotions?

Anxiety

Dejection/ Downheartedness

Anger

Excitement

Happiness

- Never
- Almost never
- Occasionally/Sometimes
- Almost every time
- Every time

How sad was it for you that the Brazilian team lost at the semi-final?

- Not at all sad
- Slighly sad
- Somewhat sad
- Moderately sad
- Extremely sad

Next, we are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person.

Think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport. Think only about those physical activities that you did for at least 10 minutes at a time.

During the **last 7 days**, on how many days did you do physical activities?
How much time did you usually spend doing physical activities on one of those days?

    Days per week: _____
    Hours per day: _____ and minutes per day: _____
    No physical activities

Think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

During the last 7 days, on how many days did you walk for at least 10 minutes at a time?

    Days per week: _____
    Hours per day: _____ and minutes per day: _____
    No walking

During the last 7 days, how much time did you spend sitting on a week day? Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

    Hours per day: _____ and minutes per day: _____

Please indicate your level of agreement or disagreement with the following statements.

Brazil, as host, profited a lot from the World Cup.
I give my very best to contribute to the success of hosting the FIFA World Cup in Brazil.
I fully support that Brazil is hosting the FIFA World Cup.
I tried to help have the FIFA World Cup in Brazil become a success story.

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

How many soccer games of your favorite team have you watched?

    In the stadium_____
    At a fan fest or public place_____
    At home_____
    In a restaurant or pub_____

How many other soccer games of the World Cup have you watched?
    In the stadium_____
    At a fan fest or public place_____
    At home_____
    In a restaurant or pub_____

Which of the following teams is your favorite team? _____

How important to you is it that the team wins?
Not important – Very important, *Response option 1-7*

How strongly do you see yourself as a fan of the team?
Not at all a fan – Very much a fan, *Response option 1-7*

How strongly do your friends see you as a fan of the team?
Not at all a fan – Very much a fan, *Response option 1-7*

During the World Cup, how closely do you follow the team via the media, a) in person or on television, b) on the radio, c) television news or a newspaper, or d) the Internet?
Never – Every day, *Response option 1-7*
How important is being a fan of the team to you?
Not important - Very important, *Response option 1-7*
How much do you dislike the team's greatest rivals?
Do not dislike – Dislike very much, *Response option 1-7*
How often did you display the team's name or insignia at your place of work, where you live, on your vehicle, or on your clothing?
Never - Always, *Response option 1-7*

Please indicate your perspective on Brazil as the host country of the FIFA World Cup. The fact that Brazil was hosting the FIFA World Cup was …
- Positive - Negative
- Good - Bad
- Favorable - Unfavorable

To anonymously track your data in the following research, we would like to ask you to create a personal code. This code consists of the first three letters of your mother's name and the last three letters of his last name.
Thanks a lot for your participation! Your participation is a great contribution to our research! Within the following month, we will contact you and ask you whether you participate again. We would highly appreciate it if you participated again.

Questionnaire for the empirical study T3

Hello and thank you again, for your participation in our last survey. In the following survey, we would like to ask you about your opinion and perspective on the Brazilian society as well as your well-being, quality of life. This time we have reduced the number of questions. Your answers will be treated strictly confidential and you will remain anonymous throughout the study. The survey will contribute to a better understanding of how Brazilians feel and what they think about their current situation of their country. The study serves scientific purposes only.

In what follows next, we are interested in your perspective on intercultural communication. Please indicate the degree to which you agree or disagree with each of the statements.

I can be as sociable as I want to be when interacting with people from different cultures.
I enjoy interacting with people from different cultures.
I think people from other cultures are narrow-minded.
I find it very hard to talk in front of people from different cultures.
I avoid those situations where I will have to deal with culturally-distinct persons.
I don't like to be with people from different cultures.
I often show my culturally-distinct counterpart my understanding through verbal or nonverbal cues.
I have a feeling of enjoyment towards differences between my culturally-distinct counterpart and me.
I respect the values of people from different cultures.
I am pretty sure of myself in interacting with people from different cultures.
I always know what to say when interacting with people from different cultures.
I get upset easily when interacting with people from different cultures.
I feel confident when interacting with people from different cultures.
I tend to wait before forming an impression of culturally-distinct counterparts.
I often get discouraged when I am with people from different cultures.

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

In what follows next, we are interested in your perspective on intercultural communication. Please indicate the degree to which you agree or disagree with each of the statements.

I think my culture is better than other cultures.
I often give positive responses to my culturally-different counterpart during our interaction.

I would not accept the opinions of people from different cultures.
I am sensitive to my culturally-distinct counterpart's subtle meanings during our interaction.
I am open-minded to people from different cultures.
I am very observant when interacting with people from different cultures.
I often feel useless when interacting with people from different cultures.
I respect the ways people from different cultures behave.
I try to obtain as much information as I can when interacting with people from different cultures.

- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

Next, we are interested in your relationships with tourists during the last two weeks.
How many tourists have you seen in your community during the past two weeks?
_____
How much contact have you made with tourists during the past two weeks?

_____

Please explain your relationship with others how satisfied are you …
... with your personal relationships (friends, parents, acquaintances, colleagues)?
... with the support you get from your family?
... with the support you get from your friends?
... with your ability to provide for or support others?
- Very dissatisfied
- Dissatisfied
- Neither satisfied or dissatisfied
- Satisfied
- Very satisfied

First, we have some questions concerning your attitude towards the Brazilian country in general. Please indicate the degree to which you agree with the following statements.

How important is being Brazilian to you?
- Not at all important
- Low
- Moderately
- Very
- Extremely

To what extent do you see yourself as a typical Brazilian?
How well does the term Brazilian describe you?
- Not at all
- Slightly
- Moderately
- Very much
- Completely

When talking about Brazil how often do you say "we" instead of "they"?
- Never
- Rarely
- Sometimes
- Often
- Always

How important is being a Brazilian to you, where 0 is not at all important and 10 is the most important thing in your life? *Response option 1-10*

We have some questions about where you live: your neighborhood or village, your town or city, your county, and so on.
How good does it make you feel when you see the Brazilian flag flying?
How good does it make you feel when you hear the Brazilian national anthem?
- Unhappy
- Slightly happy
- Somewhat happy
- Happy
- Very happy

People should work hard to move Brazil in a positive direction.

If I criticize Brazil, I do so out of love of country.

I oppose some Brazilian policies because I care about my country and want to improve it.

I express my attachment to Brazil by supporting efforts at positive change.

I support Brazil's leaders even if I disagree with their actions.

People who do not wholeheartedly support Brazil should live elsewhere.

For the most part, people who protest and demonstrate against Brazilian policy are good, upstanding, intelligent people.

Brazil is virtually always right.

I support Brazilian policies for the very reason that they are the policies of my country.

There is too much criticism of Brazil in the world, and we as its citizens should not criticize it.

I believe that Brazilian policies are almost always the morally correct ones.
- Strongly disagree
- Disagree
- Neither agree or disagree
- Agree
- Strongly agree

How close do you feel to Brazil?
- Not close
- Little close
- Moderately close
- Close
- Very close

Following we are interested in your well being, please think of the last two weeks.
How well are you able to get around?
How would you rate your quality of life?
- Very poor
- Poor
- Neither poor nor good
- Good
- Very good

How satisfied are you with your health?
- Very dissatisfied
- Dissatisfied
- Neither satisfied or dissatisfied
- Satisfied
- Very satisfied

Please answer the following questions about your relationships with others.
Do you feel happy about your relationship with your family members?
- Very unhappy
- Unhappy
- Neither happy nor unhappy
- Happy
- Very happy

How alone do you feel in your life?
- Not at all
- Slightly
- Moderately
- Very much
- Extremely

Do you get the kind of support from others that you need?
To what extent can you count on your friends when you need them?
- Not at all
- A little
- Moderately
- Mostly
- Completely

As In what comes next, we are interested in your everyday life during the last two weeks. Please rate how much you have experienced certain things in the last two weeks.
To what extent do you feel that physical pain prevents you from doing what you need to do?
How much do you need any medical treatment to function in your daily life?
How much do you enjoy life?
To what extent do you feel your life to be meaningful?
How well are you able to concentrate?
How safe do you feel in your daily life?
How healthy is your physical environment?
- Never
- Seldom
- Quite often
- Very often
- Always

The following questions ask about how completely you experience or were able to do certain things in the last two weeks.
Do you have enough energy for everyday life?
Are you able to accept your bodily appearance?
Have you enough money to meet your needs?
How available to you is the information that you need in your day-to-day life?
To what extent do you have the opportunity for leisure activities?
- Not at all
- A little
- Moderately
- Mostly
- Completely
How often do you have negative feelings such as blue mood, despair, anxiety, depression?
- Never
- Seldom
- Quite often
- Very often
- Always

The following questions ask you to say how good or satisfied you have felt about various aspects of your life over the last two weeks.

How satisfied are you…

…with your sleep?

…with your ability to perform your daily living activities?

…with your capacity for work?

…with yourself?

…with your personal relationships?

…with your sex life?

…with the support you get from your friends?

…with the conditions of your living place?

…with your access to health services?

…with your transport?

- Very dissatisfied
- Dissatisfied
- Neither satisfied or dissatisfied
- Satisfied
- Very satisfied

The questions in this scale ask you about your feelings and thoughts during the last two weeks. In each case, you will be asked to indicate by circling how often you felt or thought a certain way during the past two weeks,

How often have you…

…been upset because of something that happened unexpectedly?

…felt that you were unable to control the important things in your life?

…felt nervous and stressed?

…felt confident about your ability to handle your personal problems?

…felt that things were going your way?

…found that you could not cope with all the things that you had to do?

…been able to control irritations in your life?

…felt that you were on top of things?

…been angered because of things that were outside of your control?

…felt difficulties were piling up so high that you could not overcome them?

- Never
- Almost Never
- Sometimes
- Fairly Often
- Very Often

Next, we are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person.
Think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport. Think only about those physical activities that you did for at least 10 minutes at a time.

During the **last 7 days**, on how many days did you do physical activities?
How much time did you usually spend doing physical activities on one of those days?
    Days per week: _____
    Hours per day: _____ and minutes per day: _____
    No physical activities

Think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

During the last 7 days, on how many days did you walk for at least 10 minutes at a time?
    Days per week: _____
    Hours per day: _____ and minutes per day: _____
    No walking

During the last 7 days, how much time did you spend sitting on a week day? Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.
    Hours per day: _____ and minutes per day: _____

Which of the following teams is your favorite team? _____

How important to you is it that the team wins?
Not important – Very important, *Response option 1-7*
How strongly do you see yourself as a fan of the team?
Not at all a fan – Very much a fan, *Response option 1-7*
How strongly do your friends see you as a fan of the team?
Not at all a fan – Very much a fan, *Response option 1-7*
How closely do you follow the team via the media, a) in person or on television, b) on the radio, c) television news or a newspaper, or d) the Internet?
Never – Every day, *Response option 1-7*
How important is being a fan of the team to you?
Not important - Very important, *Response option 1-7*

How much do you dislike the team's greatest rivals?
Do not dislike – Dislike very much, *Response option 1-7*

How often did you display the team's name or insignia at your place of work, where you live, on your vehicle, or on your clothing?
Never - Always, *Response option 1-7*

Please indicate your perspective on Brazil as the host country of the FIFA World Cup. The fact that Brazil is hosting the FIFA World Cup is … *Response option 1-7*
- Positive - negative
- Good - bad
- Favorable – unfavorable

Do you remember particular moment? _____

To anonymously track your data in the following research, we would like to ask you to create a personal code. This code consists of the first three letters of your mother's name and the last three letters of his last name. Thanks a lot for your participation! Your participation is a great contribution to our research!
Do you have any comments?

APPENDIX C: MPLUS CODES

The physical domain is used as an example as one of the four quality of life domains.
This part of the code applies to all analyses: **Variable:** Names are

id	v_45b	v_34c	v_523
v_41a	v_32b	v_35c	v_524
v_42a	v_303b	v_307c	v_525
v_31a	v_268b	v_308c	v_526
v_36a	v_304b	v_309c	v_527
v_300a	v_305b	fan	negative
v_301a	v_306b	support	positive
v_302a	v_46b	stress	is_interacteng21
v_43a	v_47b	atm_during	is_respect21
v_44a	v_33b	fan_status2	is_intconf21
v_45a	v_34b	is_interacteng2	is_intenjoy21
v_32a	v_35b	is_respect2	is_intatten21
v_303a	v_307b	is_intconf2	is_interacteng32
v_268a	v_308b	is_intenjoy2	is_respect32
v_5a	v_309b	is_intatten2	is_intconf32
v_6a	v_41c	stress3	is_intenjoy32
v_8a	v_42c	fan_status3	is_intatten32
v_46a	v_31c	is_interacteng3	PHYS1
v_47a	v_36c	is_respect3	PSYCHO1
v_33a	v_300c	is_intconf3	SOCIAL1
v_34a	v_301c	is_intenjoy3	ENVIR1
v_35a	v_302c	is_intatten3	PHYS2
v_307a	v_43c	v_533	PSYCHO2
v_308a	v_44c	v_423	SOCIAL2
v_309a	v_45c	v_424	ENVIR2
v_41b	v_32c	v_425	PHYS3
v_42b	v_303c	interest	PSYCHO3
v_31b	v_268c	v_91	SOCIAL3
v_36b	v_304c	v_94	ENVIR3
v_300b	v_305c	v_96	SSIS1
v_301b	v_306c	v_396	SSIS2
v_302b	v_46c	morototal	SSIS
v_43b	v_47c	v_468	
v_44b	v_33c	feelings_WC	

Change in quality of life
TITLE: Piecewise growth model for a continuous outcome, physical health
DATA: FILE IS 3waves_short.dat;
  listwise = off;
VARIABLE:
  Names are [see list];
  Missing are all(-99);
USEVARIABLES ARE PHYS1 PHYS2 PHYS3 ;
ANALYSIS:
  Type = general;
 Estimator=ML;
MODEL:
i BY PHYS1@1 PHYS2@1 PHYS3@1;
s1   BY   PHYS1@-1   PHYS2@0 PHYS3@0;
s2   BY   PHYS1@0   PHYS2@0 PHYS3@3;
i WITH s1;
i WITH s2;
s1 WITH s2@0;
PHYS1 (1);
PHYS2 (1);
PHYS3 (1);
 [PHYS1@0 PHYS2@0 PHYS3@0];
 [i s1 s2];
s2@0;

Change in quality of life depending on perceived atmosphere
TITLE: an example of a piecewise growth model for a continuous outcome physical health incl. atmosphere
DATA: FILE IS 3waves_short.dat;
  listwise = off;
VARIABLE:
  Names are [see list];
  Missing are all(-99);
USEVARIABLES ARE PHYS1 PHYS2 PHYS3 atm_during;
ANALYSIS:
  Type = general;
 Estimator=ML;
MODEL:
i BY PHYS1@1 PHYS2@1 PHYS3@1;
s1   BY   PHYS1@-1   PHYS2@0 PHYS3@0;
s2   BY   PHYS1@0   PHYS2@0 PHYS3@3;
i WITH s1;
i WITH s2;
s1 WITH s2@0;
PHYS1 (1);
PHYS2 (1);
PHYS3 (1);
 [PHYS1@0 PHYS2@0 PHYS3@0];
 [i s1 s2];
i s1 s2 ON atm_during;
atm_during;
[atm_during];
!s1@0;
PLOT: type is plot3; series = PHYS1 PHYS2 PHYS3 (*);

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Change in team identification, 3 waves

TITLE: an example of a growth model for a continuous outcome incl. team identification

DATA: FILE IS 3waves_short.dat;
  listwise = off;

VARIABLE:
  Names are [see list];
  Missing are all(-99);
USEVARIABLES ARE SSIS1 SSIS2 SSIS3 ;

ANALYSIS:
  Type = general;
  Estimator=ML;

MODEL:
i BY SSIS1@1 SSIS2@1 SSIS3@1;
s1 BY SSIS1@-1 SSIS2@0 SSIS3@0;
s2 BY SSIS1@0 SSIS2@0 SSIS3@3;
i WITH s1;
i WITH s2;
s1 WITH s2@0;
SSIS1 (1);
SSIS2 (1);
SSIS3 (1);
 [SSIS1@0 SSIS2@0 SSIS3@0];
 [i s1 s2];
!s2@0;
!OUTPUT: tech1 residual cinterval;
PLOT: type is plot3; series = SSIS1 SSIS2 SSIS3 (*);

Change in quality of life, 3 waves

TITLE: an example of a growth model for a continuous outcome physical health, 3 waves

DATA: FILE IS 3waves_short.dat;
  listwise = off;

VARIABLE:
  Names are [see list];
  Missing are all(-99);
USEVARIABLES ARE PHYS1 PHYS2 PHYS3 SSIS1 SSIS2 SSIS3;

ANALYSIS:
  Type = general;
  Estimator=ML;

MODEL:
i BY PHYS1@1 PHYS2@1 PHYS3@1;
s1 BY PHYS1@-1 PHYS2@0 PHYS3@0;
s2 BY PHYS1@0 PHYS2@0 PHYS3@3;
i WITH s1;
i WITH s2;
s1 WITH s2@0;
PHYS1 (1);
 PHYS2 (1);
 PHYS3 (1);
 [PHYS1@0 PHYS2@0 PHYS3@0];
i with s2@0;
!s2@0;
 [i];
[s1];[s2];
ii BY SSIS1@1 SSIS2@1 SSIS3@1;
ss1 BY SSIS1@-1 SSIS2@0 SSIS3@0;
ss2 BY SSIS1@0 SSIS2@0 SSIS3@3;
ii WITH ss1;
ii WITH ss2;
ss1 WITH ss2@0;
SSIS1 (2);
SSIS2 (2);
SSIS3 (2);

[SSIS1@0 SSIS2@0 SSIS3@0];
ii with ss2@0;
!ss2@0;
 [ii];
[ss1];
[ss2];
!i with ii;
!s1 with ss1;
!s2 with ss2;
i on ii;
s1 on ss1;
s2 on ss2;
i with ss1@0;
i with ss2@0;
ii with s1@0;
ii with s2@0;
s1 with ss2@0;
s2 with ss1@0;
PLOT: type is plot3;
    series = PHYS1 PHYS2 PHYS3
(*);

Perceived atmosphere at ± 1 SD
TITLE: an example of atmosphere at +-SD on outcome physical health
DATA: FILE IS 3waves_short.dat;
  listwise = off;
USEVARIABLES   ARE   PHYS1 PHYS2 PHYS3 atmosphere;
ANALYSIS:
 Type = general;
 Estimator=ML;
DEFINE:
atmoM1SD = atmosphere-0.85557;
atmoP1SD = atmosphere+0.85557;
MODEL:
i   BY   PHYS1@1   PHYS2@1 PHYS3@1;
s1   BY   PHYS1@-1   PHYS2@0 PHYS3@0;
s2   BY   PHYS1@0   PHYS2@0 PHYS3@3;
i WITH s1;
i WITH s2;
s1 WITH s2@0;
PHYS1 (1);
PHYS2 (1);
PHYS3 (1);
 [PHYS1@0 PHYS2@0 PHYS3@0];
atmosphere;
[atmosphere] (ea);
s1@0;
 [i] (al1);
[s1] (al2);
[s2] (al3);
i ON atmosphere (ga1);
s1 ON atmosphere (ga2);
s2 ON atmosphere (ga3);
MODEL CONSTRAINT:
New (ei es1 es2 ephys1 ephys2 ephys3);
New (eim1 es1m1 es2m1 esoc1m1 esoc2m1 esoc3m1);
New (eip1 es1p1 es2p1 esoc1p1 esoc2p1 esoc3p1);

```
ei = al1 + ga1*ea;
es1 = al2 + ga2*ea;
es2 = al3 + ga3*ea;
ephys1 = ei - es1;
ephys2 = ei;
ephys3 = ei + 3*es2;
eim1 = al1 + ga1*2.6744;
es1m1 = al2 + ga2*2.6744;
es2m1 = al3 + ga3*2.6744;
esoc1m1 = eim1 - es1m1;
esoc2m1 = eim1;
esoc3m1 = eim1 + 3*es2m1;
eip1 = al1 + ga1*4.3856;
es1p1 = al2 + ga2*4.3856;
es2p1 = al3 + ga3*4.3856;
esoc1p1 = eip1 - es1p1;
esoc2p1 = eip1;
esoc3p1 = eip1 + 3*es2p1;
```

PLOT: type is plot3;
series = PHYS1 PHYS2 PHYS3 (*);
OUTPUT: tech1 residual cinterval sampstat standardized stdyx; TEch4;

Combined model, perceived atmosphere and team identification

TITLE: an example of a growth model for the outcome physical health incl atmosphere and identification

DATA: FILE IS 3waves_short.dat;
listwise = off;
USEVARIABLES ARE PHYS1 PHYS2 PHYS3 atmosphere SSIS1;

ANALYSIS:
Type = general;
Estimator=ML;

MODEL:
i BY PHYS1@1 PHYS2@1 PHYS3@1;
s1 BY PHYS1@-1 PHYS2@0 PHYS3@0;
s2 BY PHYS1@0 PHYS2@0 PHYS3@3;
i WITH s1;
i WITH s2;
s1 WITH s2@0;
PHYS1 (1);
PHYS2 (1);
PHYS3 (1);
[PHYS1@0 PHYS2@0 PHYS3@0];
[i s1 s2];
i s1 s2 ON atmosphere;
i s1 s2 ON SSIS1;
atmosphere;
[atmosphere];
SSIS1;
[SSIS1];

PLOT: type is plot3;
series = PHYS1 PHYS2 PHYS3 (*);

OUTPUT:
tech1 residual cinterval sampstat standardized stdyx;
modindices (all);
TEch4;