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Walkable scores for selected three east Texas counties: physical activity and policy implications

Wycliffe W. Njororai Simiyu
University of Texas at Tyler, wnjororai@uttyler.edu

Fletcher J. Njororai
University of Texas at Tyler, fnjororai@uttyler.edu

Billystrom Aronya Jivetti

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Walkable scores for selected three east Texas counties: physical activity and policy implications

Wycliffe W. Njororai Simiyu[1]
Fletcher Njororai[2]
Billystrom Aronya Jivetti[3]

Abstract

Introduction: Physical activity has become an important intervention against overweight and obesity cases in the USA and worldwide. One key aspect of physical activity is walking, which has been identified as a component that can easily be incorporated into one's lifestyle. Recent studies on physical activity have focused on promoting walking as a health enhancing endeavor. In 2010, the proportion of Texas adults who reported no participation in leisure time activity (26.7%) was significantly higher than the national average (24.4%). However, many Texans, like most Americans, are sedentary.
Purpose: This study examined the walkability of the environments in selected counties in east Texas including Wood, Van Zandt and Smith counties.
Methods and material: The data was drawn from the Walkscore.com and was based on all the zip codes in the three counties in east Texas. The community capitals were used a framework for analysis.
Results: Only three (8.82%) zip codes had walkable scores between 70 and 89; five (14.71%) had scores between 50 and 69; four (11.76%) between 25 and 49 and 22 (64.71%) had a score below 24.
Discussion: The vast majority (26, 76.47%) of zip codes are highly dependent on vehicle transport.
Conclusions and recommendations: Stakeholders need therefore to focus on causes for the minimal walkability so that practical interventions are generated to enhance the physical activity friendly infrastructure so as to enhance the well-being of the residents in these three east Texas counties.

Keywords: Physical activity; Walk score; Social and built capital; Zip code; Pedestrian; Neighborhood; Walkability

[1] Associate Professor, University of Texas at Tyler, Department of Health and Kinesiology, Texas, USA, wnjororai@uttyler.edu
[2] Assistant Professor, University of Texas at Tyler, Department of Health and Kinesiology, Texas, US., fnjororai@uttyler.edu
[3] Assistant Professor, Wiley College, Department of Sociology, Texas, USA, bajivetti@wileyc.edu

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Introduction

Engagement in regular physical activity has increasingly become an important intervention measure to counter the increasing levels of overweight and obese cases not only in the United States of America (USA), but also around the world (Ferreira et al., 2006; Ogden et al., 2010, 2012; Trowbridge and Schmid, 2013). According to Ogden et al., (2012) 27.5% of men were obese in 1999-2000. This prevalence rate rose to 35.5% by 2009–2010. Among women, 33.4% were obese in 1999–2000 and by 2009–2010, it had increased slightly to 35.8%. It is apparent that in 1999–2000, the prevalence of obesity was higher in women than in men. However, between 1999–2000 and 2009–2010, the difference in the prevalence of obesity between men and women decreased so that in 2009–2010, the prevalence of obesity in men was virtually equal to that in women. The data from 2009–2010 show that over 78 million U.S. adults and about 12.5 million U.S. children and adolescents were obese. The same data also show that almost 41 million women and more than 37 million men aged 20 and over were obese. Among children and adolescents aged 2–19, more than 5 million girls and approximately 7 million boys were obese (Ogden, et al., 2012). These figures reveal the prevalence of obesity and overweight cases in the U.S. as serious health issues that are calling for interventions for all age groups and gender.

It is widely documented that regular physical activity is associated with reduced risk for chronic disease and a healthier, longer life (Ferreira et al., 2006; Manley, 1996; Ogden et al., 2010, 2012; Trowbridge and Schmid, 2013; Warburton et al., 2006). For example, cardiovascular benefits of regular physical activity include lower risk for heart disease, high blood pressure, stroke, abnormal blood cholesterol and triglycerides, diabetes, and obesity. Despite these evidence, many Texans, like most Americans, are sedentary. It is evident that the number of Texans who are overweight or obese continues to grow, as by 2011, 66.7 percent of adult Texans were overweight or obese, up from 64.1 percent in 2005 (Combs, 2011). In 2010, the proportion of Texas adults who reported no participation in leisure time activity (26.7%) was significantly higher than the national average (24.4%). Around the U.S., less than half (47%) of the adults meet recommendations for aerobic physical activity (NHIS, 2011). For youth, only 29% of high school students reported meeting the goal of 60 minutes of daily physical activity over the last week (CDC, 2012). To make matters worse, there has been a decline in the proportion of children walking or biking to school from 48% in 1969 to 13% in 2009 (McDonald et al., 2011). This rapid decline in the physical activity levels of the U.S. population has become a major health issue. Therefore, a major form of intervention that has emerged, as a central goal of national and international efforts, is the promoting of physical

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activity both as recreational exercise and as a part of day-to-day utilitarian travel by foot or bicycle to prevent and control obesity (Trowbridge and Schmid, 2013).

Other interventions that have shown success in promoting physical fitness include: limiting screen time for youth, establishing policies for physical activity in child care and school settings; creating physical activity curricula based on national standards; establishing worksite wellness programs that promote physical activity by offering incentives, designated exercise areas, safe walking paths and stairwell programs; supporting health care provider reminders related to physical activity screening and education; building infrastructure for safe walking and biking in the community; and improving access to public transportation. According to Sinnett et al., (2011), the places we live in shape our lives. According to the authors, citizens of any great city, town and village feel that what makes their locality great are issues that affect the walking environment including: how safe they feel when walking around their area; how attractive their local streets are; the quality and proximity of their local shops and services; and the care taken to maintain the basic quality of the street. The realization that physical activity is no longer the province of school based physical education, but a community affair has prompted various federal, state and local agencies to take initiatives to enhance the promotion and participation in physical activity at the local community level. Therefore, there is a huge desire on the part of various federal and state agencies to raise the proportion of adults, children and youth who engage in regular physical activity.

The commitment to engage more people in physically active lifestyles should be evident in the localities where people reside. Ideally, places where people have access to school playgrounds, recreation and sports related parks and facilities, street designs that provide for bicycling, walking to and from shopping stores, fresh food markets and other amenities that can easily be accessed on foot or on a bicycle rather than by car would give an indicator of the suitability of the area for physical activity engagement (Sinnett et al., 2011). One of the ways that a locality or city can be evaluated on their walkability is by using the walk score. Indeed walkability has been linked to quality of life in many ways. According to Rogers et al., (2010), health related benefits of physical exercise, the accessibility and access benefits of being able to walk to obtain some of your daily needs, or the mental health and social benefits of reduced isolation are a few of the many positive impacts on quality of life that can result from a walkable neighborhood. This is even more so in the modern society where in the face of increasing energy costs and climate considerations, the ability to walk to important locations is a key component of sustainable communities (Rogers et al., 2010).

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The community capitals framework as postulated by Flora and Flora (2012) is used to contextualize the walkability within three counties in east Texas. According to Flora and Flora (2012), all communities have resources that can be reduced, saved for future use, or invested to create new resources or capital. The community capitals framework was designed to analyze how the various components in communities work. The premise of this framework is the realization that successful communities pay attention to the seven capitals in their possession ultimately sustaining community and economic development. These are natural, cultural, human, social, political, financial and built capitals. Natural capital comprises the natural resources including the local landscape, mountains, rivers and streams, lakes, green spaces, parks and recreation areas, forests, wildlife, and soil. Cultural capital reflects the values, heritages, ethnicities, generations, languages, festivals, stories, and traditions.

Human capital involves skills, abilities, leadership, and the ability to access external resources and bodies of knowledge. Social capital involves the networks, groups, and organizations in community that confer a sense of belonging and bonding in the community. Political capital is the ability of a community to have access to community resources or influence the rules and conventions for daily life, mediated through leaders and officers who are elected by the residents. Built capital is the infrastructure like roads, telecommunications, bridges, schools, fire departments, playgrounds, and soccer fields. It is this infrastructure that can be assumed to be the backbone of the community thus the main focus of development efforts. They bolster network communication and access to services and market making individuals and business to be productive in the community. Finally, the financial resources that can be invested in the community while building wealth for community development from financial capital. Examples include loan funds, tax incentives, foundation grants, and bonds.

Communities that are sustainable have economic security, healthy ecosystem, and social inclusion for all residents (Flora & Flora, 2012). These capitals can only be effectively transformed to outcomes that are productive and sustainable through community cooperation. Rural development activities influence natural capital, often negatively, decreasing long term development. Similarly, the limits and opportunities of human activities are in turn determined by natural capital. Another crucial aspect is the fact that access and control of natural capital manifests differently based on ethnicity, gender, and social class (Flora, 2011).

The community capitals framework has attained a broad usage in social capital studies and community development projects. The framework has proved to be expedient in addressing

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community issues such as poverty reduction and rural development in dry areas (Flora & Thiboumery, 2005), community resilience (Magis, 2010), sustainable livelihoods and community change (Gutierrez-Montes, Emery & Fernandez-Baca, 2009), childhood obesity (Flora & Gillespie, 2009), community transformation (Emery & Flora, 2006), and measuring success in communities (Jacobs, 2007). These studies resonate with the premise of this study about the walkability in selected east Texas counties. As observed, walkability depends on the existing built and natural capital whose use could reflect aspects of ethnicity, gender, and social class.

Much of east Texas is a mix of rural and urban communities that are involved in agricultural production and limited tourist attractions (Combs, 2008; Constance, 2002). Hunt and Crompton's (2008) study on the (tourism) attraction compatibility in east Texas is a prime example of how community capitals interact to sustain community economic development initiatives. The study was commissioned by the City of Tyler in east Texas with aim of using the findings to determine how the city's tourist (natural and built capital) attractions would be used in improving development strategies like cooperative ticketing, transportation (built capital), and other promotional activities. The Caldwell Zoo in Tyler, which was under investigation, attracts close to 600,000 visitors a year which influences human, financial, built and social capitals of the City. The study found a higher compatibility between the zoo and other attractions in the city and an increased spending on tourism by visitors. Generally, it was evident that the zoo, together with other ancillary attractions, had contributed to the city's overall attractiveness. The study was able to provide the city of Tyler with ideas on future investments in financial and build capitals. This is another example of natural, financial capital, and built capitals at play. Access to the attraction facilities helps to build other forms of capital including social and human which tend to overlap. Rural communities invest their resources in these capitals in different ways for maximum community economic development. Whereas the impacts and outputs of these investments are varied, the common thread is that community capitals do overlap.

Based on scholarship and practice, incorporating these seven capitals is crucial in making for effective and sustainable programs. The framework identifies factors that affect the success or failure of communities especially the role of their collective action. Accordingly, the theory supports the broad purpose and methodology of social capital studies. The body of literature cited also buttresses this theoretical framework, as it helps to describe the issues surrounding rural-urban connectivity with regards to social capital. For instance, when people use a community center or youth center, it is likely to boost the financial and social capital of the community. Thus, how communities succeed is a function of community capitals. Built capital, as this study posits, can only

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become effective when joined with the other capitals. The community capital framework is therefore ideal in understanding how built capital or assets complement walkability in selected east Texas county communities where this study is based.

Purpose of the study

Walk scores have been found to be a valid measure of the physical activity profile of a particular locality. However, there is a paucity of studies that have utilized walkability scores as a tool for determining the walkability of communities. This study aimed at assessing the accessibility of physical amenities in various zip codes within Wood, Van Zandt and Smith counties in east Texas. The data was derived from www.walkscore.com, an online resource that promotes walking as a healthy lifestyle in communities.

Methods and materials

This study involved collection of Walk Score data for three purposely selected east Texas counties including Smith, Van Zandt and Wood. There are 34 different zip codes in these three counties including 7 in Wood County, 7 in Van Zandt and 20 Smith county. All the zip codes were used in the data collected for the study. These data were accessed from www.walkscore.com in the spring of 2015. According to Duncan et al., (2011), Walk Score® (www.walkscore.com) is a publicly available large-scale method for calculating walkability (Carr et. 2010, 2011). Walk Score was developed by Front Seat Management (www.frontseat.org), a software development company based in Seattle, WA, which focuses on software with civic applications. These authors further explain that Walk Score uses publicly available data to assign a score to a location based on the distance to and variety of nearby commercial and public frequently-visited facilities. Data sources used by Walk Score include Google, Education.com, Open Street Map and Localeze. Facilities are divided into five categories: educational (e.g., schools), retail (e.g., grocery, drug, convenience and bookstores), food (e.g., restaurants), recreational (e.g., parks and gyms) and entertainment (e.g., movie theaters). The Walk Score algorithm then calculates the distance to the closest of each of the five facilities, using straight-line distances, and calculates a linear combination of these distances weighted both by facility type priority and a distance decay function (Duncan et al., 2011). The Walk Score data has previously been validated by Duncan et al., (2011) as viable for establishing the physical activity profile of a community. The walk score helps one to find a walkable place to live depending on preference on accessing certain utilities including physical activity, grocery stores, super markets, restaurants, apartments etc. The Walk Score is a number between 0 and 100 that measures the walkability of any address. The scoring between 90 and 100 is a walker's paradise

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where daily errands do not require a car; 70 to 89, is very walkable as most errands can be accomplished on foot; 50 to 69 is somewhat walkable as some errands can be accomplished on foot; 25 to 49 is car dependent as most errands require a car and 0 to 24 is car dependent as almost all errands require using a car.

Results

Table one shows the walk scores for all the 34 zip codes in the selected counties of Wood, Van Zandt and Smith in east Texas.

Table 1: Walkable scores per zip code in Wood, Van Zandt and Smith Counties

City	*Zip Code*	*Walkable score*
Wood County		
Alba	75410	22
Golden	75444	10
Winnsboro	75494	66
Yantis	75497	17
Hawkins	75765	23
Mineola	75773	0
Quitman	75783	49
Van Zandt County		
Canton	75103	52
Edgewood	75117	38
Fruitvale	75127	0
Grand Saline	75140	51
Wills Point	75169	0
Ben Wheeler	75754	20
Van	75790	0
Smith County		
Tyler	75701	60
	75702	32
	75703	24
	75704	0
	75705	4
	75706	7
	75707	4
	75708	1
	75709	3
	75710	73
	75711	63
	75712	73
	75713	73
	75798	32

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	75799	24
Winona	75792	23
Flint	75762	0
Whitehouse	75791	4
Tyler	75771	0
Tyler	75750	0

Legend:

1. 90 and 100 is a walker's paradise where daily errands do not require a car;

2. 70 to 89, is very walkable as most errands can be accomplished on foot;

3. 50 to 69 is somewhat walkable as some errands can be accomplished on foot;

4. 25 to 49 is car dependent as most errands require a car; and

5. 0 to 24 is extremely car dependent as almost all errands require using a car.

The results revealed that the following 8 (23.53%) zip codes had a zero walkable score including 75127,75169, 75790, 75773, 75762, 75704, 75771, 75750 and the following 14 (41.18%) were also extremely car dependent 75754, 75410, 75444, 75497, 75765, 75703, 75792, 75706, 75705, 75799, 75708, 75707, 75709, 75791. For these 4 (11.76%) zip codes, most errands require the use of a car including 75117, 75783, 75798 and 75702. These 5 (14.71%) zip codes including 75701, 75103, 75140, 75494, and 75711 were somewhat walkable as some errands can be accomplished on foot; while the other 3 (8.82%) zip codes including 75710, 75712 and 75713 were very walkable as most errands can be accomplished on foot. Thus out of 34 zip codes in this three East Texas Counties, only three (8.82%) merited a walkable score of above 70% showing how heavily car dependent these areas are and the need for deliberate plans to change these trends and promote active living.

Discussion

According to Sallis et al., (2012), the design of the built environments, a broad term encompassing aspects of community and transportation system design such as sidewalk or park access and even interior building features such as stair design, plays an important role as a determinant of daily physical activity levels. On the other hand, Frost et al. (2010) conducted a review of the effects of the built environment on physical activity behavior, specifically in rural areas. Some of the key findings include consistent positive associations between physical activity and aesthetics, safety/crime, recreational facilities, trails, parks, and walkable destinations. However, there were also inconsistent associations between physical activity and street lighting, the presence or use of

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sidewalks or shoulders, as well as safety from and density of neighborhood traffic. These findings have implications for east Texas which is mainly rural based. The east Texas counties of Van Zandt, Wood and Smith counties show a high dependence on motor vehicles for movement.

This dependence on motor vehicles therefore limits the amount of walking that can be undertaken by the residents of these locations. Indeed, higher levels of out-of-school-hours physical activity and walking appear to be significantly associated with higher levels of urban density and neighborhoods with mixed-use planning, especially for older children and adolescents. It is important to point out that the zip codes that were very walkable, as most errands can be accomplished on foot, are those located in the city of Tyler. It is most likely that these zip codes have a higher occupancy rate of low income people and that the area is also likely to be well built with convenience stores and other built capital such as schools, recreational facilities such as parks, and other public utilities within a walking distance. It is apparent that proximate recreational facilities predict young people's level of physical activity. However, there are inconsistencies in the literature involving studies with younger children. Independent mobility increases with age. For younger children, the impact of the built environment is influenced by the decision-making of parents as the gatekeepers of their behavior. Cross-cultural differences may also be present and are worthy of greater exploration. As children develop and are given more independent mobility, it appears that the way neighborhoods are designed becomes a determinant of whether children are able, and are permitted by their parents, to walk and use destinations locally. If older children and adolescents are to enjoy health and developmental benefits of independent mobility, a key priority must be in reducing exposure to traffic and in increasing surveillance on streets (i.e. 'eyes-on-the-street') through neighborhood and building design, by encouraging others to walk locally, and by discouraging motor vehicle use in favor of walking and cycling. Parents need to be assured that the rights and safety of pedestrians (and cyclists) - particularly child pedestrians and cyclists - are paramount if we are to turn around the 'child-free streets', now so prevalent in contemporary Australian and US cities.

Despite the many health benefits of engaging in physical activity, many young people are not engaging in recommended levels of physical activity due to limited opportunities both within schools and outside in the communities (Ferreira et al., 2006; Johnson, 2000; WHO, 2000a, b). According to Ferreira et al., (2006), longitudinal studies have shown that a steep decrease in physical activity (PA) levels occurs during adolescence and that PA levels established in youth tend to track into adulthood. These trends show that physical activity promotion in childhood and youth can facilitate a carryover of healthful habits into adulthood and a lifelong protection from other risk

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factors. This implies the need to promote physical activity at community and neighborhood levels hence the need for physical activity-friendly environments being a priority in current public health policies (WHO, 1998, 2004). Given the relationship between physical inactivity and obesity prevalence in the U.S., a focus on the accessibility and opportunities for physical activity engagement is an issue that different counties and cities have to address as a major public health issue. Indeed recent studies have demonstrated associations between childhood obesity and environmental features, namely at the home and neighborhood level (Ferreira et al., 2006). These are aspects that leaders at the county level have to plan for as a priority. Combs (2011), contextualized this priority succinctly when she stated thus in the introduction to the Gaining Costs, Losing Time: The Obesity Crisis in Texas, Special Report;

"The importance of maintaining a healthy lifestyle is something I experience first-hand on my family ranch in West Texas. On the ranch, you have to be fit and healthy to survive. If your car breaks down or runs out of gas, you might have to walk 10 miles or more to the nearest farm for help. The fight to curb obesity has important implications for all Texans, from their wallets to their personal health. The magnitude of the challenge requires an equally bold response. Our efforts will require us to consider and challenge the way we live, and the importance we place on a healthy lifestyle" (Introductory Letter).

There is need to aggressively push for people to lead active and healthier lifestyles and walking is a huge component. This is because walkable neighborhoods offer a variety of benefits to peoples' health, the environment, finances, and communities. It is clear that the way neighborhoods are designed with respect to proximity and connectivity to local destinations, including schools, parks and shopping centers, and the presence of footpaths becomes a determinant of whether people are able to walk and use destinations locally. According to the social-ecological framework of behavior change, people's behaviors are influenced by many factors including family, friends, local surroundings, built environment and community (Flora & Flora, 2012; Rogers, 2013; Sinnett et al., (2011). Rogers (2013) contends that in order to bring about behavior change, the supporting environments and policies must be changed to make it easier for people in those environments to make healthy choices. If people are to enjoy health and developmental benefits of independent mobility, a key priority must be in reducing exposure to traffic and in increasing surveillance on streets through neighborhood and building design, by encouraging others to walk locally, and by discouraging motor vehicle use in favor of walking and cycling. According to Rogers et al., (2010):

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The ability to comfortably walk to locations of need and importance in one's home neighborhood and quality of life have been linked by researchers, practitioners, and home owners. The research …suggests that there is another component of the equation linking walkability to quality of life and that is social capital. Analysis of a survey of neighborhoods of varying built form revealed strong correlations between the number of locations one could walk to and indicators of social capital. Just like economic and human capital, social capital can bring benefits to those who possess it, such as reduced isolation, career enhancement connections, neighborhood safety, to name a few. It is these benefits that may enhance an individual's quality of life. Walkability enhances social capital by providing the means and locations for individual to connect, share information, and interact with those that they might not otherwise meet (p. 213).

One of the widely available physical activity friendly facilities in various communities are schools. It would make sense to encourage widespread use of school facilities as centers of community physical activity promotion programs. According to Boarnet et al., (2005), schools offer opportunities to focus physical activity promotion efforts. Community-based initiatives, such as Safe Routes to Schools (http://www.saferoutesinfo.org/), which promote environmental changes and policies to encourage walking and cycling, are shown to increase active transportation to school for children. According to Watson and Dannenberg (2008), environmental walkability improvements focused on school travel for children have ancillary benefits for the community at-large.

Conclusion

The amenities that make a neighborhood walkable include a center, people to attract businesses and for public transit to run frequently; mixed income, mixed use: affordable housing located near businesses; parks and public space: plenty of public places to gather and play; pedestrian design: schools and workplaces are close enough that most residents can walk from their homes; and streets are designed for bicyclists, pedestrians, and transit (Sinnett et al., (2011). Walkable neighborhoods offer a variety of benefits to peoples' health, the environment, finances, and communities. Indeed neighborhoods that are designed with ease of access, proximity and connectivity to local destinations, including schools, parks and shopping centers, and the presence of footpaths influence peoples' choices to walk and use destinations locally. If people are to enjoy health and developmental benefits of independent mobility, a key priority must be in reducing exposure to traffic and in increasing surveillance on streets through neighborhood and building design, by encouraging others to walk locally, and by discouraging motor vehicle use in favor of

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walking and cycling. It is clear that Wood, Van Zandt and Smith counties in east Texas are predominantly motor vehicle dependent for movement of the local people. This indicates that there is a need for more amenities that make a neighborhood walkable. Amenities such as shopping centers seem to be either far apart or not well endowed with walking and other physical activity friendly infrastructure.

It is therefore recommended that the local leaders and policy makers come together to plan and prioritize the improvement of the infrastructure to attract businesses, public transport, establish more parks and public spaces to gather and play; pedestrian design; schools and workplaces that are close enough that most residents can walk from their homes; and streets designed for bicyclists, pedestrians, and transit. It is imperative that policy makers strive to provide for physical activity friendly environments to accommodate safe walking and biking if the physical activity profile of this east Texas locality is to improve for the wellbeing of the people. In line with this observation, Frank (2004) makes valid points when he argues that utilizing proven built-environment strategies to increase physical activity as a way to reduce obesity will require continued investment in evaluation of successful programs and broad-based collaboration with a diverse set of non-traditional public and private stakeholders. This will entail engaging environmental design decision-makers in local government, private design firms, and private development firms, who will require data demonstrating the comprehensive "value" of prioritizing physical activity within the context of community design, city planning and real estate investment.

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