ACTIVE TRAVEL IN GERMANY AND THE USA: CONTRIBUTIONS OF DAILY WALKING AND CYCLING TO PHYSICAL ACTIVITY

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Abstract

Background: *Travel surveys in Europe and the USA show large differences in the proportion of walking and cycling trips without considering implications for physical activity.*

Purpose: *This study estimates differences between Germany and the USA over time in population levels of daily walking and cycling at different health-enhancing thresholds across socio-demographic groups.*

Methods: *Uniquely comparable national travel surveys for the USA (NHTS 2001 and 2009) and Germany (MiD 2002 and 2008) were used to calculate the number, duration, and distance of active trips per capita. The population-weighted person and trip files for each survey were merged to calculate population levels of any walking/cycling, walking/cycling 30 minutes/day, and achieving 30 minutes in bouts of at least 10 minutes. Logistic regression models controlled for the influence of socioeconomic variables. Data were analyzed in 2010.*

Results: *Between 2001/2002 and 2008/2009 the proportion of 'any walking' was stable in the USA (18.5%) but increased in Germany from 36.5% to 42.3%. The proportion of 'any cycling' in the USA remained at 1.8% but increased in Germany from 12.1% to 14.1%. In 2008/2009 the proportion of '30 minutes walking and cycling' in Germany was 21.2% and 7.8%, respectively, compared to 7.7% and 1.0% in the USA. There is much less variation in active travel among socioeconomic groups in Germany than in the USA. German women, children, and seniors walk and cycle at much higher rates than their counterparts in the USA.*

Conclusions: *High rates of active travel in Germany show that daily walking and cycling can help a large proportion of the population to meet recommended physical activity levels.*

Introduction

In recent years, many Western industrialized countries have encouraged walking and cycling because active travel increases daily physical activity and may help protect against obesity and other chronic diseases.[1-13] Levels of active transport vary widely among countries, with much more walking and cycling in most European countries than in the USA.[6, 14] Europeans are also more likely to use public transport, which usually includes a walk or bike ride to and from bus stops and train stations.[15-17]

International comparative studies of active travel are typically hampered by inconsistencies among country surveys in their timing, variable definitions, and survey methodology.[5, 6, 18-20] The most recent national travel surveys of Germany and the USA are an exception. They are similar in their design and timing in almost every respect and thus offer a unique opportunity to compare proportions of the population engaging in active travel in two countries.

Both Germany and the USA are affluent countries with market economies and federal systems of democratic government. The two countries are similar in many ways that enable meaningful comparisons of active travel and physical activity.[21, 22] Both countries have vast roadway systems, high rates of car ownership, and roughly the same proportion of licensed drivers.[23-26] The automobile industry is even more important in Germany than in the USA, since car manufacturing accounts for twice as high a proportion of the national economy in Germany.[27, 28] Moreover, the car is at least as much of a status symbol in Germany as in the USA.[29, 30,31] Just as in the USA, most suburban development in Germany occurred after the Second World War during a period of rapid motorization.[32, 33, 34] Greater mix of land-uses, higher densities, and less

suburban sprawl in Germany are mainly the result of explicit policies and not simply history.[31, 35-37]

International comparisons of travel have focused on the share of trips by mode of transport while ignoring the resulting differences in physical activity and its distribution across population subgroups.[6, 35, 38] The purpose of this article is to translate trip-based data from disaggregate travel surveys into estimates of population proportions of walking and cycling in Germany and the USA at different health enhancing thresholds, using a methodology originally developed to analyze travel surveys in Sydney, Australia.[39] This article assesses changes in active travel over time and differences between Germany and the USA, noting variations by gender, age, education, employment, income, car ownership, and urban vs. rural household location.

Methods

Data Sources

This study, conducted in 2010, used data from the 2001 and 2009 National Household Travel Surveys (NHTS) for the USA and the 2002 and 2008 Mobilität in Deutschland (MiD) surveys for Germany.[40-43] The methods used in travel surveys can vary widely.[18] The NHTS and MiD surveys are highly comparable along many dimensions [see Appendix Table A]. For both years each country's surveys used almost identical data collection methods and included virtually the same variables. The surveys are so similar because German researchers used the 2001 NHTS survey for the USA as a model for their 2002 MiD survey. In fact, due to changes in methodology starting with the 2001 NHTS, and copied by the 2002 MiD, the NHTS and MiD surveys are more comparable to each other than to any earlier surveys within their respective countries.

The data collection period was 14 months for all four surveys. After being contacted by phone and agreeing to participate, households completed a computer assisted telephone interview (CATI). All household members recorded their travel in a one day travel diary during a randomly assigned day. The diary helped respondents report their travel day activities in a subsequent phone interview. All surveys included adults and children as target population. Travel information for children younger than 15 years was collected through proxy interviews with parents. Household response rates for both the German and American surveys dropped from about 40% in 2001/2002 to about 20% in 2008/2009. The MiD and NHTS survey statisticians attribute the drop in response rate to the rising percentage of cell-phone-only households, the use of caller ID to screen unwanted calls, and increasing privacy concerns. All four surveys use weights to control for non-response bias and stratification of the sampling process. Thus, they are designed to be representative of the population as a whole.

There are a few minor differences between the surveys in methodology and variable measurement. Although both surveys used stratified random sampling, the German surveys drew their sample from municipal citizen registries, while the U.S. surveys relied on random digit dialing (RDD). The 2009 NHTS only included children 5 years and older, while the 2001 NHTS and both MiD surveys included children of all ages. Thus, this analysis excludes children younger than 5 years to ensure comparability among all four surveys.

All four surveys define trips as from one address to another, and they include a special data file reporting the mode and number of public transport access trips. In contrast to the German

surveys, walk and bike trips originating and ending at the same address (e.g. 'walking the dog') were recorded as two trips in the USA—using the farthest distance from the trip origin as splitting point for the two trips. To ensure comparability across countries, this analysis split 'round trips' in the German data using the same methodology as in the NHTS. In contrast to MiD, the NHTS specifically reminded interviewers and respondents not to forget walk trips by including multiple prompts during the CATI. Thus, the estimates in this article may understate the actual differences in active travel between Germany and the USA.

Measurement Procedures and Variables

Outcome variables. For the trip-based analysis, the daily frequency, duration, and distance of walking and cycling per capita were calculated by dividing the daily totals by the number of persons. Daily rates were multiplied by 365 to approximate annual rates per capita. For the person-based analysis, trip characteristics (number, duration, and distance) were aggregated and matched to the trip maker and then added to the person dataset. The person dataset included individuals who did not make any trips during the travel day (i.e. stayed at home), and thus were not included in the trip file. To include them in the walking and cycling prevalence estimates, they were assigned to the 'no walking' and 'no cycling' categories.

Following methods developed in an Australian study,[39] the daily physical activity analysis used three different thresholds: [1] 'any walk or bike trip'; [2] '30 minutes or more of walking and cycling'; and [3] '30 minutes or more of walking and cycling accumulated in bouts of at least 10 minutes each,' thus excluding trips shorter than 10 minutes. Each of these three thresholds of physical activity has important implications for public health.[44-46]

Covariates. The person files of both surveys provide information about socio-economic and demographic characteristics that may affect active travel due to their correlation with physical activity.[47] All four surveys report comparable information about gender, age, car ownership, education level, and employment. Income is an exception, since NHTS reports annual pre-tax incomes while MiD reports monthly net salaries. To make the income information comparable across surveys, it was categorized into quartiles. This paper also examines differences in walking and cycling of respondents living in urban vs. rural locations as an approximation of the impact of land use on active travel.[48, 49] The official definitions of urban and rural areas vary somewhat between Germany and the USA, but are roughly comparable.[50, 51]

Statistical Analysis

The first part of the analysis compares changes in active travel over time within each country. Statistical significance in travel trends is determined by calculating differences in weighted proportions or means between two independent samples. The analysis then compares differences in active travel for population subgroups within and between the countries for the year 2008/2009, examining the statistical significance of bi-variate differences. Logistic regressions of each country's survey (separately) enable comparison of the relationships between socio-economic variables and walking and cycling levels within and across countries. The regressions exclude children younger than 16 because of missing information on their employment and education status. Finally, logistic regressions on a pooled MiD 2008 and NHTS 2009 dataset estimate the likelihood of walking and cycling in Germany compared to the USA, after adjusting for socio-economic and demographic variables.

Results

The trip-based analysis shows that the number, duration, and distance of walk and bike trips per capita increased in both countries between 2001/2002 and 2008/2009, but the increases were much larger in Germany than in the USA. In 2008/2009, Germans averaged more than twice as many walk trips per day as Americans (1.30 vs. 0.52) and almost ten times as many bike trips (0.39 vs. 0.04). Moreover, Germans walked an average of 71 hours more per year than Americans (112.5 vs. 41.2) and cycled 34 hours more (39.1 vs. 4.7).

[Insert Table 1 about here]

The gap in active travel also widened between the two countries over the last decade (see Figure 1). Increases in walking and cycling were statistically significant at all three thresholds in Germany, but only for the two levels of '30 minute walking' in the USA. In 2008/2009, the proportion of 'any walking' in Germany was twice the U.S. level (42.3% vs. 18.6%). The proportion of Germans reaching the two levels of '30 minute walking' was three times the U.S. share (21.2% vs. 7.7%; and 20.3% vs. 7.3%). The proportions for all three levels of cycling were seven times greater in Germany than the USA.

[Insert Figure 1 about here]

Tables 2 and 3 disaggregate results for population subgroups for walking and cycling for the years 2008/2009. For each demographic subgroup, Germans achieved significantly higher levels of 'any' and '30 minute' walking and cycling than Americans. Differences between countries in the proportions of 'any walking' and '30 minute walking' were the least for households without cars. At the other end of the spectrum, the proportion of Germans 65 and older walking at least 30 minutes a day was almost five times the share of elderly Americans (28.6% vs. 5.9%). Similarly, the proportion reporting '30 minutes of cycling per day' was 13 times greater for the

elderly in Germany than in the USA (6.5% vs. 0.6%). The highest proportion of cycling in the USA was among children aged from 5 to 15 years, but was still much lower than among German children (4.2% vs. 21.5% for ‘any cycling’ and 1.6% vs.10.6% for ‘30 minute’ cycling).

[Insert Tables 2 and 3 about here]

As shown in Tables 2 and 3, only a small proportion of the US population walks or bikes on a daily basis. But a separate analysis (not shown) focusing only on active travelers reveals that daily cyclists in the USA spend as much time cycling as German cyclists: the median time cycled is 30 minutes per day in both countries. Similarly, daily walkers in the USA spend roughly the same time walking as German walkers: the median time walked is 29 minutes in the USA vs. 30 minutes in Germany. Thus, the large gap between the countries in active travel is almost entirely due to the higher proportion of Germans who cycle and walk.

Table 4 compares four logistic regression models for each country, estimating population proportions of ‘any walking’, ‘30 minute walking’, ‘any cycling’, and ’30 minute cycling’. Within each country, adjusted odds ratios (AORs) represent the population subgroup’s likelihood of achieving a particular level of walking or cycling relative to a specific reference group assigned the base value 1.00, while controlling for other variables in the analysis. For example, Americans with a university degree were roughly twice as likely to achieve any active travel threshold compared to Americans with less than a high school degree (AORs between 1.88 and 2.00). In Germany, AORs for the university degree subgroup were significantly smaller, ranging from 1.18 to 1.36. Differences in AORs for active travel between households with and without cars, the highest and lowest income quartiles, and urban vs. rural household location were all significantly larger for the USA than for Germany. American men were three times as likely as

women to cycle at all and to achieve 30 minutes of cycling (AORs 2.80 and 3.18). The gender differential is much smaller in Germany (AORs 1.13 and 1.21). Finally, the likelihood of achieving 30 minutes of walking per day declines with age in the USA (AOR 0.71 for 65+), but increases with age in Germany (AOR 1.64 for 65+).

[Insert Table 4 about here]

Controlling for gender, age, education, car ownership, income, employment, urban/rural residence, and day of the week, logistic regressions (not shown in Table 4) on a pooled USA-Germany dataset showed that Germans, compared to Americans, were over three times more likely to walk 30 minutes per day (AOR 3.42, 95% CI 3.30-3.56) and ten times more likely to cycle 30 minutes per day (AOR 10.30, 95% CI 9.55-11.10).

Discussion

The main finding of this analysis is that active travel is far more prevalent in Germany than in the USA. The proportion of the population achieving 30 minutes of walking and/or cycling per day is more than three times higher in Germany than in the USA (28.4% vs. 8.6%). From 2001/02 to 2008/09, there were much larger increases in walking and cycling in Germany than in the USA. The average annual hours spent walking and cycling per capita rose more than twice as much in Germany as in the USA (18.2 vs. 8.4 hours), and average annual distance walked and cycled per capita rose four times as much in Germany (109.6 km vs. 25.6km). Differences between the two countries in active travel are similar for all three thresholds of daily walking and cycling.

One important difference is the large and statistically significant increase in ‘any walking’ and

'any cycling' in Germany from 2001/2002 to 2008/2009, while there was no increase in the USA. The growth in active travel in Germany is largely due to the increased proportion of the population walking and/or cycling, while the much smaller increase in active travel in the USA is due to more walking and/or cycling by roughly the same proportion of the population. Daily cyclists and walkers in the USA spent roughly the same time cycling and walking in 2008/2009 as their counterparts in Germany. Thus, the main problem in the USA is the low proportion of the population engaging in active travel.

Without exception, active travel is much higher for all socioeconomic groups in Germany than in the USA. In particular, vulnerable and/or risk-averse groups walk and bike much more in Germany. German proportions of 30 minutes of daily active travel are five times higher for seniors (34.3% vs. 6.3%) and more than three times as high for children (30.3% vs. 8.6%) and women (29.3% vs. 8.2%). The inequitable distribution of active travel in the USA suggests the need for targeted policies to increase walking and cycling among seniors, children, and women, in particular.

Increasing active travel in the USA requires a multifaceted approach consisting of transport policies, land-use planning, and promotional programs. Germany's experience with such measures may help guide US initiatives.[36, 52-54] Since the 1970s, federal, state, and local transport policies in Germany have increased the cost of driving and restricted car use and parking in cities, while simultaneously improving the safety and convenience of walking and cycling.[33, 36, 55-57] Car-free zones in city centers, traffic-calmed residential streets, and extensive networks of footpaths and bikeways have greatly increased walking and cycling safety.[54-56, 58]

Infrastructure improvements have been complemented by mandatory cycling training for all schoolchildren, driver training that focuses on avoiding the endangerment of pedestrians and cyclists, and strict enforcement of traffic regulations for both motorists and non-motorists.[54, 59] While German land-use policies restrict low density sprawl, they explicitly encourage mixed-use, compact development that generates many trips—even in new suburbs—short enough to walk or cycle.[31, 58, 60-62]

Many studies confirm the significant effect of the built environment, transport policies, and promotional programs on walking and cycling.[63-71] There is strong evidence that population density, mixed land use, street connectivity, walking and cycling facilities, and overall urban design influence active travel.[66, 68, 69, 72-76] In addition to making walking and cycling safer and more convenient, transport policies also play an important role in determining the relative attractiveness of alternative modes of travel.[55, 58, 62, 74, 77-80] For example, the low cost of car use and the lack of car-restrictive policies in the USA provide a strong incentive for driving and thus indirectly discourage active travel.[35, 36, 81-83]

Even without changes in land use, which take time, there is considerable potential for increasing walking and cycling in the USA. In 2009, 27% of all trips were shorter than 1 mile in the USA, but only 36% of those short trips were made by walking or cycling. By comparison, Germans walked or cycled for 70% of trips shorter than a mile. The lack of basic walking and cycling infrastructure in many American cities and suburbs helps explain why even short trips are made by car.[3, 84] Providing safe and attractive sidewalks, crosswalks, and bikeways is the first step in facilitating active travel.

Especially in the USA, it is crucial that improved infrastructure be complemented by 'soft measures' such as Safe Routes to Schools, cycling training, temporary street closures with car-free events, group bike rides, bike-to-work and walk-to-school days, media campaigns, and community outreach programs. Many studies have documented the effectiveness of 'soft measures,' which also include individualized marketing of active transport by one-on-one advice to households on how to shift trips from cars to walking and cycling.[85-95]

In contrast to Germany, there has been virtually no increase over the past decade in the proportion of Americans walking or cycling on a daily basis. The infrastructure, programs, and policies needed to increase walking and cycling are well known and tested, with decades of successful experience in many European cities.[15, 35, 52, 56, 58, 68] Some American cities, such as New York, Portland, and Minneapolis, have already implemented many of these measures with considerable success.[3, 68, 96-99] Thus, the public health challenge is to encourage more widespread use of these measures to promote active travel.

References

1. WHO. Obesity in Europe: The Case for Action. London: International Obesity Taskforce of the World Health Organization; 2002.
2. European Commission. Green Paper - Towards a new culture for urban mobility. Brussels, Belgium: European Comission; 2007.
3. USDOT. The national walking and bicycling study: 15-year status report. Washington, D.C.: U.S. Department of Transportation, Federal Highway Administration; 2010.
4. USDHHS. Physical Activity and Health: A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services; 1996.
5. Pucher J, Buehler R, Bassett D, Dannenberg A. Walking and cycling to health: recent evidence from city, state, and international comparisons. Am J Public Health 2010;100(10):391-414.
6. Bassett D, Pucher J, Buehler R, Thompson D, Crouter S. Walking, Cycling, and Obesity Rates in Europe, North America and Australia. J Phys Act Health 2008;5(6):795-814.
7. Andersen LB, Schnohr P, Schroll M, Hein HO. All-cause mortality associated with physical activity during leisure time, work, sports, and cycling to work. Arch Intern Med 2000;160(11):1621-8.
8. Gordon-Larsen P, Boone-Heinonen J, Sidney S, Sternfeld B, Jacobs DR, Jr., Lewis CE. Active commuting and cardiovascular disease risk: the CARDIA study. Arch Intern Med 2009;169(13):1216-23.
9. Shephard R. Is active commuting the answer to population health? Sports Med 2008;39(9):751-758.
10. Koplan JP, Dietz WH. Caloric imbalance and public health policy. JAMA 1999;282(16):1579-81.
11. Hamer M, Chida Y. Active commuting and cardiovascular risk: a meta-analytic review. Prev Med 2008;46(1):9-13.
12. Brownson RC, Boehmer TK, Luke DA. Declining rates of physical activity in the United States: What are the contributors? Annu Rev Public Health 2005;26:421-443.
13. Owen N, Bauman A, Brown W. Too much sitting: a novel and important predictor of chronic disease risk? Br J Sports Med 2009;43(2):81-83.
14. Kenworthy P, Laube F. Millennium cities database. Brussels, Belgium: UITP; 2001.
15. TRB. Making transit work: Insight from Western Europe, Canada and the United States. Washington DC: Transportation Research Board, National Research Council, National Academy Press; 2001.
16. Besser L., Dannenberg A. Walking to public transit: steps to help meet physical activity recommendations. Am J Prev Med. 2005;29(4):273-280.
17. Greenberg M., Lane R., Zupan J., Renne J. Physical activity and use of suburban train stations: an exploratory analysis. Journal of Public Transportation 2005;8:89-116.
18. Kunert U, Kloas J, Kuhfeld H. Design Characteristics of National Travel Surveys. International Comparison for 10 countries. Transportation Research Record 2002;1804:107-116.
19. Guthold R, Ono T, Strong KL, Chatterji S, Morabia A. Worldwide variability in physical inactivity - A 51-country survey. Am J Prev Med 2008;34(6):486-494.
20. Bauman A, Finegood DT, Matsudo V. International perspectives on the physical inactivity crisis-Structural solutions over evidence generation? Prev Med 2009;49(4):309-312.
21. International Monetary Fund. World Economic Outlook Database. In: International Monetary Fund; 2010.

22. Wentzel B, Wentzel D, editors. Wirtschaftlicher Systemvergleich Deutschland/USA. Stuttgart: Lucius & Lucius Verlagsgesellschaft; 2000.
23. IRF. World Road Statistics. Brussels: International Road Federation; 2007.
24. Buehler R, Pucher J, Kunert U. Making Transportation Sustainable: Insights from Germany. Washington, D.C.: The Brookings Institution; 2009.
25. BMVBS. Verkehr in Zahlen. German transport in figures. Berlin: German Federal Ministry of Transportation and Urban Development; 1991-2010.
26. USDOT. Highway Statistics. Washington, D.C.: U.S. Department of Transportation, Federal Highway Administration; 1990-2010.
27. VDA. Automobilproduktion in Deutschland. Offenbach: Verband der Automobilindustrie; 2007.
28. USDOT. Transportation Statistics. Washington D.C.: U.S. Department of Transportation, Federal Highway Administration; 2006-2010.
29. Schmucki B. Der Traum vom Verkehrsfluss: Städtische Verkehrsplanung seit 1945 im deutsch-deutschen Vergleich. Munich: Campus/ Deutsches Museum Muenchen; 2001.
30. Wachs M, Crawford M, Wirka S, Rikala T. The Car and the City: The Automobile, The Built Environment, and Daily Urban Life. Ann Arbor: University of Michigan Press; 1992.
31. Nivola PS. Laws of the landscape. How policies shape cities in Europe and America. Washington D.C.: Brookings Institution Press; 1999.
32. Jackson KT. The crabgrass frontier. The suburbanization of the United States. Oxford: Oxford University Press; 1985.
33. Baron P. Transportation in Germany: A historical overview. Transportation Research Part A: Policy and Practice 1995;29(1):9-20.
34. BMVBS. Urban development and urban policy in Germany. Bonn: German Federal Ministry of Transportation and Urban Development, Bundesamt fuer Bauwesen und Raumordnung; 2000.
35. Newman P, Kenworthy J. Sustainability and cities. Washington D. C.: Island Press; 1999.
36. Buehler R. Transport Policies, Automobile Use, and Sustainable Transport: A Comparison of Germany and the United States. Journal of Planning Education and Research 2010;30(September 2010):76-93.
37. Burchell R, Lowenstein G, Dolphin WR, Galley C. Costs of sprawl 2000. Washington D.C.: Transportation Research Board. National Academy Press; 2002.
38. Pucher J, Lefevre C. The urban transport crisis in Europe and North America. Mac-Millan Press; 1996.
39. Merom D, van der Ploeg HP, Corpuz G, Bauman AE. Public health perspectives on household travel surveys active travel between 1997 and 2007. Am J Prev Med 2010;39(2):113-121.
40. BMVBS. Mobilitaet in Deutschland 2008/2009. Bonn/Berlin: German Federal Ministry of Transportation; 2010.
41. DIW. Mobilitaet in Deutschland 2002. Kontinuierliche Erhebung zum Verkehrsverhalten. Endbericht. Berlin: DIW. German Institute for Economic Research. ; 2004.
42. ORNL. National household travel survey 2001. Version 2004. In: U.S. Department of Energy, Oak Ridge National Laboratories; 2005.
43. USDOT. National Household Travel Survey 2009. Version 2.0/2010. Washington, DC: U.S. Department of Transportation, Federal Highway Administration; 2010.

44. USDHHS. Physical Activity Guidelines for Americans. Atlanta, GA: U.S. Department of Health and Human Services; 2008.
45. Centers for Disease Control and Prevention. Physical activity for everyone: How much physical activity do adults need? Atlanta, GA: Centers for Disease Prevention and Control; 2010.
46. Haskell WL, Lee IM, Pate RR, Powell KE, Blair SN, Franklin BA, et al. Physical activity and public health: updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. Circulation 2007;116(9):1081-93.
47. Trost SG, Owen N, Bauman AE, Sallis JF, Brown W. Correlates of adults' participation in physical activity: review and update. Med Sci Sports Exerc. 2002;34:1996-2001.
48. Saelens BE, Handy SL. Built environment correlates of walking: a review. Medecine and Science in Sports and Exercise 2008;40:S550-S566.
49. Frank LD, Engelke PO. The built environment and human activity patterns: exploring the impacts of urban form on public health. J Plann Lit 2001;16:202-218.
50. USDOC. Urbanized areas. Washington, D.C.: U.S. Department of Commerce, U.S. Census Bureau; 2000.
51. BMVBS. Raumordnungsbericht 2005 - Report on Spatial Development in Germany. Bonn: German Federal Ministry of Transportation and Urban Development; 2005.
52. Buehler R, Pucher J. Sustainable Transport in Freiburg: Lessons from Germany's Environmental Capital. International Journal of Sustainable Transport 2011;5(1):43-70.
53. Pucher J. Bicycling Boom in Germany: A Revival Engineered by Public Policy. Transportation Quarterly 1997;51(4):31-46.
54. Pucher J, Buehler R. Making Cycling Irresistible: Lessons from the Netherlands, Denmark, and Germany. Transport Reviews 2008;28(1):495 - 528.
55. Bratzel S. Conditions of success in sustainable urban transport policy - Policy change in 'relatively successful' European cities. Transport Reviews 1999;19(2):177-190.
56. Beatley T. Green Urbanism: Learning from European Cities. Washington, D.C.: Island Press; 2000.
57. Newman P, Beatley T, Boyer H. Resilient Cities. Responding to Peak Oil and Climate Change. Washington, D.C.: Island Press; 2009.
58. Vuchic V. Transportation for livable cities. New Brunswick, NJ: Center for Urban Policy Research (CUPR); 1999.
59. Pucher J, Dijkstra L. Making walking and cycling safer: lessons from Europe. Transportation Quarterly 2000;54(3):25-50.
60. Pucher J, Buehler R. Walking and cycling for healthy cities. Built Environment 2010;36(4):391-414.
61. Schmidt S, Buehler R. The Planning Process in the U.S. and Germany: A Comparative Analysis. International Planning Studies 2007;12(1):55-75.
62. Buehler R. Determinants of Transport Mode Choice: A Comparison of Germany and the USA. Transport Geography 2011;in press.
63. Krizek KJ, Forsyth A, Baum L. Walking and Cycling International Literature Review. Melbourne, Australia: Victoria Department of Transport; 2009.
64. TRB. Does the Built Environment Influence Physical Activity: Examining the Evidence. Washington, D.C.: Transportation Research Board, National Academy of Sciences; 2005.
65. Ogilvie D, Mitchell R, Mutrie N, Petticrew M, Platt S. Shoe leather epidemiology: active travel and transport infrastructure in the urban landscape. Int J Behav Nutr Phys Act 2010;7(43):1-15.

66. Heinen E, Van Wee B, Maat K. Bicycle use for commuting: A literature review. Transport Reviews 2010;30(1):105-132.
67. Reynolds C, Harris M, Teschke K, Cripton P, Winters M. The impact of transportation infrastructure on bicycling injuries and crashes: A review of the literature. Environ Health 2009;8(47).
68. Pucher J, Dill J, Handy S. Infrastructure, programs, and policies to increase bicycling: an international review. Prev Med 2010;50 Suppl 1:S106-25.
69. Ewing R, Cervero R. Travel and the Built Environment: A Meta Analysis. J Am Plann Assoc 2010;76(3):265 - 294.
70. Gomez LF, Sarmiento OL, Parra DC, Schmid TL, Pratt M, Jacoby E, et al. Characteristics of the Built Environment Associated With Leisure-Time Physical Activity Among Adults in Bogota, Colombia: A Multilevel Study. J Phys Act Health 2010;7:S196-S203.
71. Frank L, Kavage S. A National Plan for Physical Activity: The Enabling Role of the Built Environment. J Phys Act Health 2009;6:S186-S195.
72. Aytur SA, Rodríguez DA, Evenson KR, Catellier D. Relationships of urban containment policies to physical activity: A time-series analysis of metropolitan areas, 1990-2002. Am J Prev Med 2008;34(4):320-332.
73. Rodríguez D, Evenson KR, Diez-Roux A, Brines S. Land use, residential density, and walking: The Multi-Ethnic Study of Atherosclerosis. Am J Prev Med 2009;37(5):397-404.
74. Rodríguez DA, Joo J. The relationship between non-motorized travel behavior and the local physical environment. Transportation Research Part D: Transport and Environment 2004;9(2):151-173.
75. Bassett Jr DR, Pucher J, Buehler R, Thompson DL, Crouter SE. Walking, cycling, and obesity rates in Europe, North America and Australia. J Phys Act Health 2008;5(6):795-814.
76. Berrigan D, Pickle LW, Dill J. Associations between street connectivity and active transportation. International Journal of Health Geographics 2010;9(20):1-18.
77. Aytur S, Rodríguez DA, Evenson KR. Promoting active community environments through land use and transportation planning. Am J Health Promot 2007;21(4S):397-407.
78. Rodríguez DA, Aytur SA, Oakes M, Forsyth D, K. C. Relation of modifiable neighborhood attributes to walking. Prev Med 2008;47:260-264.
79. Pucher J. Urban travel behavior as outcome of public policy. J Am Plann Assoc 1988;54(4):509-520.
80. Pucher J, Dijkstra L. Promoting safe walking and cycling to improve public health: lessons from The Netherlands and Germany. Am J Public Health 2003;93(9):1509-1516.
81. Handy SL, Weston L, Mokhtarian PL. Driving by Choice or Necessity? Transportation Research Part A 2005;39 (3):183 - 203.
82. Downs A. Still Stuck in Traffic. Washington, D.C.: Brookings Institution Press; 2004.
83. Shoup D. The high cost of free parking. Chicago: APA Planners Press; 2005.
84. Surface Transportation Policy Project. Mean streets - How far have we come? Washington, D.C.: STPP; 2004.
85. Telfer B, Rissel C, Bindon J, T. B. Encouraging cycling through a pilot cycling proficiency training program among adults in central Sydney. J Sci Med Sport 2006;9(1-2):151-156.
86. Bauman A, Rissel C, Garrard J, Kerr I, Speidel R, Fishman E. Getting Australia Moving: Barriers, facilitators and interventions to get more Australians physically active through cycling.

Melbourne, Australia: Cycling Promotion Fund. Funded by the Australian Government, Department of Health and Ageing; 2008.

87. Rose G, Marfurt H. Travel behaviour change impacts of a major ride to work day event. Transportation Research A 2007;41:351–364.

88. Gomez L, Sarmiento O, Lucimi D, Espinosa G, Forero R, Bauman A. Prevalence and factors associated with walking and bicycling for transport among young adults in two low-income localities of Bogotá, Colombia. J Phys Act Health 2005;2:445–449.

89. Sarmiento O, Torres A, Jacoby E, Pratt M, Schmid T, Stierling G. The Ciclovía-recreativa: a mass recreational program with public health potential. J Phys Act Health 2010; (S2):S163-S180.

90. Jensen S. How to obtain a healthy journey to school. Transportation Research A 2008;42(3):475-486.

91. McDonald N, Aalborg A. Why parents drive children to school: Implications for Safe Routes to School programs. J Am Plann Assoc 2009;75(3):331-342.

92. Orenstein MR, Gutierrez N, Rice TM, Cooper JF, Ragland DR. Safe Routes to School safety and mobility analysis. Berkeley, CA: Traffic Safety Center, Univ. of California at Berkeley; 2007.

93. Staunton C, Hubsmith D, Kallins W. Promoting safe walking and biking to school: The Marin County success story. Am J Public Health 2003;93:1431–1434.

94. Yang L, Sahlqvist S, McMinn A, Griffin SJ, Ogilvie D. Interventions to promote cycling: systematic review. BMJ 2010;341:c5293.

95. Ogilvie D., Foster C.E., Rothnie H., Cavill N., Hamilton V., Fitzsimons C.F., et al. Interventions to promote walking: systematic review. Br Med J 2007.

96. Alliance for Biking and Walking. Bicycling and Walking in the United States: 2010 Benchmarking Report. Washington, D.C.: Alliance for Biking and Walking; 2010.

97. Bike Walk Twin Cities. Snapshot Minneapolis: Bicycling and Walking. St. Paul, MN: Bike Walk Twin Cities; 2008.

98. Pucher J, Buehler R. Analysis of cycling policies and trends in large American and Canadian cities. Washington, D.C.: U. S. Department of Transportation, Research and Innovative Technology Administration; 2011.

99. League of American Bicyclists. Bicycling Friendly Community Program. Washington, D.C.: League of American Bicyclists; 2010.

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Appendix Tables:

Table 1. Daily and Annual Walking and Cycling Trips, Duration, and Distance per Capita

USA			Germany		
	2001	2009		2002	2008
	Mean	Mean		Mean	Mean
Percent of All Trips (%)			***Percent of All Trips (%)***		
Walking	**8.6**	**10.5***	Walking	**22.6**	**23.7***
Cycling	**0.9**	**1.0***	Cycling	**8.7**	**10.0***
Public Transport	**1.6**	**1.9***	Public Transport	**7.7**	**8.5***
Number of Trips			***Number of Trips***		
Trips per capita per day			***Trips per capita per day***		
Walking	**0.46**	**0.52***	Walking	**1.08**	**1.30***
Cycling	**0.03**	**0.04***	Cycling	**0.32**	**0.39***
Trips per capita per year			***Trips per capita per year***		
Walking	**167.9**	**189.8***	Walking	**394.2**	**474.5***
Cycling	**11.0**	**14.2***	Cycling	**116.8**	**142.4***
Duration			***Duration***		
Minutes per capita per day			***Minutes per capita per day***		
Walking	**5.42**	**6.77***	Walking	**15.81**	**18.49***
Cycling	**0.75**	**0.77**	Cycling	**5.79**	**6.42***
Hours per capita per year			***Hours per capita per year***		
Walking	**33.0**	**41.2***	Walking	**96.2**	**112.5***
Cycling	**4.5**	**4.7**	Cycling	**35.2**	**39.1***
Distance			***Distance***		
Km per capita per day			***Km per capita per day***		
Walking	**0.45**	**0.49***	Walking	**1.00**	**1.13***
Cycling	**0.08**	**0.11***	Cycling	**0.94**	**1.11***
Km per capita per year			***Km per capita per year***		
Walking	**164.3**	**178.9***	Walking	**365.0**	**412.5***
Cycling	**29.2**	**40.2***	Cycling	**343.1**	**405.2***

* Statistically significant change within the country during the period 2001/2002 to 2008/2009 ($P<0.05$).

Note: Excludes children younger than 5 years.

Source: Calculated by the authors based on NHTS 2001, NHTS 2009 Version 2.0, MiD 2002, and MiD 2008.

Table 2. Proportions of Any Walking and 30 min Walking by Population Subgroup, 2008/2009

	Any walking		30 min walking	
	USA *(n=308,901)* [a]	**Germany** *(n=58,882)* [a]	**USA** *(n=308,901)* [a]	**Germany** *(n=58,882)* [a]
	% (95% CI) [b]		% (95% CI) [b]	
Gender				
Male	**18.5%**	**40.3%**	**7.5%**	**19.3%**
	(17.9-19.1)	(39.5-41.2)	(7.1-7.9)	(18.7-20.0)
Female	**18.6%**	**44.2%**	**7.8%**	**22.9%**
	(18.1-19.2)	(43.4-45.0)	(7.4-8.3)	(22.3-23.6)
Age group				
5-15	**21.2%**	**53.9%**	**7.0%**	**19.7%**
	(20.0-22.3)	(52.5-55.3)	(6.3-7.7)	(18.6-20.8)
16-24	**18.6%**	**42.3%**	**7.0%**	**15.0%**
	(17.3-20.0)	(40.8-43.9)	(6.2-7.9)	(13.9-16.2)
25-44	**20.0%**	**39.7%**	**8.4%**	**18.9%**
	(19.1-21.0)	(38.4-41.0)	(7.7-9.0)	(18.0-19.9)
45-64	**18.2%**	**38.2%**	**8.6%**	**21.0%**
	(17.5-19.0)	(37.3-39.1)	(8.1-9.1)	(20.3-21.7)
65+	**13.2%**	**45.0%**	**5.9%**	**28.6%**
	(12.4-13.9)	(43.7-46.3)	(5.4-6.4)	(27.5-29.8)
Education				
Less than High School Degree	**18.9%**	**43.1%**	**7.8%**	**23.9%**
	(17.3-20.6)	(41.8-44.3)	(6.8-8.9)	(22.9-25.0)
High School Degree	**15.4%**	**42.0%**	**6.4%**	**21.6%**
	(14.7-16.0)	(40.9-43.1)	(6.0-6.8)	(20.7-22.5)
University Degree	**22.3%**	**46.5%**	**10.2%**	**23.8%**
	(21.5-23.2)	(45.0-48.1)	(9.6-10.9)	(22.6-25.1)
Employment				
Employed	**18.2%**	**36.3%**	**7.6%**	**17.0%**
	(17.6-18.8)	(35.4-37.2)	(7.2-8.0)	(16.4-17.7)
Not in Workforce or Unemployed	**17.9%**	**47.9%**	**8.3%**	**25.1%**
	(17.2-18.7)	(47.1-48.7)	(7.7-8.8)	(24.3-25.7)
Income				
Lowest Quartile	**21.6%**	**46.1%**	**9.2%**	**24.2%**
	(20.6-32.6)	(44.8-47.3)	(8.5-10.0)	(23.2-25.2)
Second Quartile	**16.1%**	**41.3%**	**6.3%**	**20.4%**
	(15.3-17.0)	(40.3-42.4)	(5.8-6.9)	(19.5-21.3)
Third Quartile	**17.4%**	**40.8%**	**7.4%**	**19.5%**
	(16.6-18.2)	(39.7-41.8)	(6.8-7.9)	(18.7-20.4)
Highest Quartile	**19.8%**	**40.2%**	**7.9%**	**18.8%**
	(18.3-19.1)	(38.6-41.9)	(7.4-8.5)	(17.8-19.9)
Number of Cars				
No Car	**48.9%**	**62.0%**	**23.7%**	**30.3%**
	(46.2-51.7)	(59.8-64.1)	(21.4-26.2)	(28.3-32.4)
One Car	**21.9%**	**43.7%**	**8.2%**	**22.5%**
	(20.9-23.0)	(42.8-44.5)	(7.6-8.8)	(21.8-23.2)
Two Cars	**17.1%**	**37.3%**	**6.8%**	**18.0%**
	(16.5-17.8)	(36.5-38.1)	(6.4-7.3)	(17.4-18.7)
Three or More Cars	**12.6%**	**27.9%**	**5.5%**	**13.6%**
	(12.1-13.2)	(26.5-29.3)	(5.1-5.9)	(12.5-14.7)
Urban vs. Rural				
Urban	**20.9%**	**44.2%**	**8.7%**	**22.2%**
	(20.4-21.5)	(43.5-44.9)	(8.4-9.1)	(21.6-22.8)
Rural	**11.1%**	**37.3%**	**4.4%**	**18.7%**
	(10.5-11.8)	(36.7-38.8)	(4.0-4.8)	(17.9-19.5)

[a] Excludes children younger than 5 years.
[b] Differences between countries were statistically significant at P<0.05 for all population subgroups.
Source: Calculated by the authors based on NHTS 2009 Version 2.0 and MiD 2008.

Table 3. Proportions of Any Cycling and 30 min Cycling by Population Subgroup, 2008/2009

	Any cycling		30 min cycling	
	USA *(n=308,901)* [a]	**Germany** *(n=58,882)* [a]	**USA** *(n=308,901)* [a]	**Germany** *(n=58,882)* [a]
	% (95% CI) [b]		% (95% CI) [b]	
Gender				
Male	**2.6%**	**15.3%**	**1.5%**	**8.5%**
	(2.3-2.8)	(14.7-15.9)	(1.3-1.7)	(8.1-9.9)
Female	**0.9%**	**13.0%**	**0.4%**	**7.0%**
	(0.8-1.0)	(12.5-13.6)	(0.3-0.5)	(6.6-7.5)
Age group				
5-15	**4.2%**	**21.5%**	**1.6%**	**10.6%**
	(3.7-4.7)	(20.4-22.7)	(1.4-2.0)	(9.8-11.4)
16-24	**1.4%**	**16.0%**	**0.9%**	**9.0%**
	(1.1-1.8)	(14.9-17.2)	(0.6-1.2)	(8.1-9.9)
25-44	**1.5%**	**13.3%**	**0.9%**	**7.2%**
	(1.2-1.8)	(12.5-14.3)	(0.7-1.1)	(6.5-7.9)
45-64	**1.3%**	**14.0%**	**0.9%**	**7.7%**
	(1.1-1.5)	(13.4-14.7)	(0.7-1.1)	(7.2-8.2)
65+	**0.7%**	**10.3%**	**0.5%**	**6.5%**
	(0.5-0.9)	(9.6-11.1)	(0.4-0.7)	(5.9-7.8)
Education				
Less than High School Degree	**1.5%**	**13.5%**	**1.0%**	**7.4%**
	(1.0-2.0)	(12.7-14.4)	(0.6-1.6)	(6.8-8.1)
High School Degree	**0.8%**	**13.5%**	**0.5%**	**7.4%**
	(0.7-1.0)	(12.7-14.4)	(0.4-0.7)	(6.8-8.1)
University Degree	**2.0%**	**15.4%**	**1.3%**	**9.2%**
	(1.7-2.3)	(14.3-16.5)	(1.1-1.6)	(8.3-10.1)
Employment				
Employed	**1.4%**	**13.2%**	**0.9%**	**7.0%**
	(0.8-1.1)	(12.6-13.8)	(0.8-1.1)	(6.6-7.5)
Not in Workforce or Unemployed	**0.9%**	**15.0%**	**0.6%**	**8.5%**
	(0.8-1.1)	(14.5-15.6)	(0.5-0.8)	(8.0-8.9)
Income				
Lowest Quartile	**1.5%**	**14.4%**	**0.8%**	**8.5%**
	(1.2-1.9)	(13.6-15.3)	(0.7-1.0)	(7.9-9.3)
Second Quartile	**1.4%**	**14.3%**	**0.8%**	**7.8%**
	(1.2-1.7)	(13.6-15.1)	(0.7-1.0)	(7.3-8.4)
Third Quartile	**1.9%**	**14.3%**	**1.0%**	**7.8%**
	(1.6-2.3)	(13.6-15.0)	(0.8-1.2)	(7.3-8.4)
Highest Quartile	**2.2%**	**14.6%**	**1.3%**	**7.9%**
	(1.9-2.5)	(13.5-15.7)	(1.0-1.6)	(7.3-8.6)
Number of Cars				
No car	**2.6%**	**18.6%**	**1.4%**	**12.0%**
	(1.8-3.7)	(16.9-20.5)	(1.0-2.1)	(10.6-13.6)
One car	**1.6%**	**15.4%**	**0.9%**	**8.4%**
	(1.3-1.9)	(14.9-16.0)	(0.7-1.2)	(8.0-8.9)
Two cars	**1.9%**	**11.8%**	**1.0%**	**6.0%**
	(1.7-2.1)	(11.3-12.4)	(0.9-1.2)	(5.6-6.4)
Three or More Cars	**1.7%**	**9.9%**	**0.8%**	**5.1%**
	(1.6-1.9)	(8.9-10.9)	(0.7-1.0)	(4.5-5.9)
Urban vs. Rural				
Urban	**1.9%**	**14.9%**	**1.1%**	**8.5%**
	(1.7-2.0)	(14.4-15.4)	(1.0-1.2)	(8.2-8.9)
Rural	**1.3%**	**12.4%**	**0.6%**	**5.9%**
	(1.1-1.5)	(11.7-13.1)	(0.5-0.7)	(5.4-6.4)

[a] Excludes children younger than 5 years.
[b] Differences between countries were statistically significant at P<0.05 for all population subgroups.
Source: Calculated by the authors based on NHTS 2009 Version 2.0 and MiD 2008.

Table 4. Relative Likelihood of Walking and Cycling for Population Subgroups, 2008/2009

	Any Walking Adj. Odds Ratio[a]		**30 min Walking** Adj. Odds Ratio[a]		**Any Cycling** Adj. Odds Ratio[a]		**30 min Cycling** Adj. Odds Ratio[a]	
	USA	GER	USA	GER	USA	GER	USA	GER
Gender								
Female	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Male	1.00	0.89**	1.02	0.87**	2.80**	1.13**	3.18**	1.21**
Employment								
Not in Workforce/ or Unemployed	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Employed	0.98	0.69**	0.81**	0.62**	1.04	0.91**	1.03	0.92
Age Group								
16-24	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
25-44	0.88**	0.77**	0.95	1.41**	0.70**	0.72**	0.70**	0.65**
45-64	0.87**	0.73**	1.07*	1.48**	0.63**	0.75**	0.70**	0.72**
65+	0.58**	0.67**	0.71**	1.64**	0.32**	0.48**	0.33**	0.53**
Education Level								
Less than High School Degree	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
High School Degree	1.17**	1.10**	1.18**	1.09**	1.08	0.96	1.10	0.97
University Degree	1.95**	1.36**	2.00**	1.24**	1.88**	1.18**	1.94**	1.25**
Number of Cars								
No Vehicles	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
One Car	0.29**	0.48**	0.33**	0.77**	0.39	0.71**	0.41**	0.66**
Two Cars	0.19**	0.32**	0.25**	0.63**	0.24**	0.39**	0.25**	0.37**
Three or More Cars	0.16**	0.26**	0.20**	0.54**	0.21**	0.30**	0.22**	0.27**
Income								
Lowest Quartile	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Second Quartile	1.09**	1.09**	1.13**	1.01	1.07	1.14**	1.06	1.06
Third Quartile	1.23**	1.14**	1.34**	1.02	1.14	1.32**	1.17*	1.26**
Highest Quartile	1.44**	1.20**	1.58**	1.07	1.36**	1.42**	1.45**	1.26**
Urban vs. Rural								
Rural	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Urban	1.34**	1.13**	1.32**	1.04	1.42**	1.18**	1.47**	1.38**
Observations[b]	238,786	29,362	238,786	29,362	238,786	29,362	238,786	29,362

* P<0.05; ** P<0.01

[a] Relative likelihoods were calculated using logistic regressions, which control for the influence of other variables.

[b] Excludes persons younger than 16 years.

Source: Calculated by the authors based on NHTS 2009 Version 2.0 and MiD 2008.

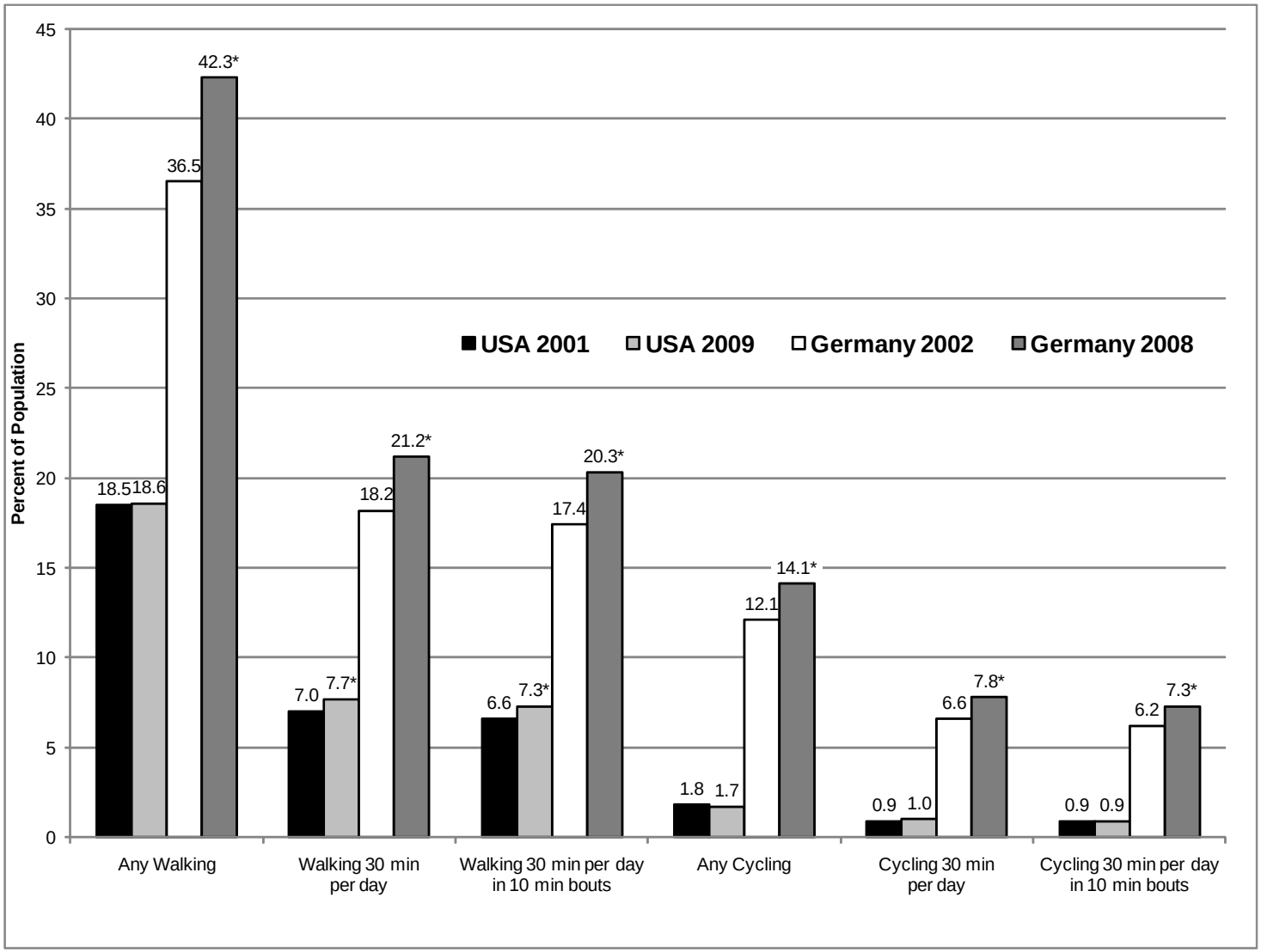

Figure 1. Changes in Population Proportions of Active Travel at Different Thresholds

* Statistically significant change within the country during the period 2001/2002 to 2008/2009 (P<0.05).

Note: Excludes children younger than 5 years.

Source: Calculated by the authors based on NHTS 2001, NHTS 2009 Version 2.0, MiD 2002, and MiD 2008.

Appendix Tables

Table A. Comparability of German and U.S. Travel Surveys 2001/2002 and 2008/2009			
		MiD 2002 and 2008 (Germany)	***NHTS 2001 and 2009 (USA)***
Collection Rhythm		Kontinuierliche Verkehrserhebung (KONTIV) '76, '82, '89 MID '02,'08	Nationwide Personal Transportation Survey (NPTS) '69, '77, '83, '90, '95 NHTS '01, '09
Survey Period		14 months 11/2001 - 12/2002 | 02/2008-04/2009	14 months 03/2001 - 04/2002 | 03/2008-04/2009
Sample Size	*Households*	25,848 (2002) | 25,922 (2008)	69,817 (2001) | 150,147 (2009)
	Individuals	61,729 (2002) | 60,713 (2008)	162,758 (2001) | 304,184 (2009)
Survey Method		Computer Assisted Telephone Interview (CATI) (95% in 2002 and 100% in 2008)	CATI (100% in 2001 and 2009)
Target Population		civilian population	
Eligibility of Household Members		adults and all children in 2002 and 2008	adults and all children in 2001 adults and children 5 and older in 2009
Sampling Technique		stratified random sample	
Data Collection Period per Respondent		1 day travel diary for randomly assigned travel day	
Response Rates (% of households)		42% (2002) | 21% (2008)	41% (2001) | 20% (2009)
Inclusion Criterion for Households		at least 50% of household members responding	at least 50% of household members over 18 years old responding
Weights		selection reciprocal, non-response, household size, weekday, month, regional charactertistics; trimming of large weights	
Data Level		household, person, trip, car	
Representative		for nation and individual states	for nation and individual Census regions
Definition of Trips		from one address to another	
Walk and Bike Access and Egress of Public Transport		number of access and egress trips by foot and bike	
Special Treatment of Active Transport		none	round trips from and to the same address count as two trips; multiple prompts to report short walk and bike trips
Sources: MiD and NHTS surveys.[40-43]			

Table B. Prevalence of 30 min Active Travel per Day in 10 min Bouts by Population Subgroup

	30 minute walking		30 minute cycling	
	USA *(n=308,901)* [a]	**Germany** *(n=58,882)* [a]	**USA** *(n=308,901)* [a]	**Germany** *(n=58,882)* [a]
	% (95% CI) [b]		**%** (95% CI) [b]	
Gender				
Male	**7.1%**	**18.5%**	**1.5%**	**8.0%**
	(6.8-7.6)	(17.9-19.2)	(1.3-1.7)	(7.6-8.5)
Female	**7.5%**	**22.0%**	**0.4%**	**6.7%**
	(7.1-7.9)	(21.4-22.7)	(0.3-0.5)	(6.3-7.1)
Age group				
5-15	**6.7%**	**18.6%**	**1.6%**	**10.0%**
	(6.0-7.4)	(17.6-19.7)	(1.3-1.9)	(9.3-10.9)
16-24	**6.7%**	**14.5%**	**0.8%**	**8.6%**
	(5.9-7.6)	(13.4-15.7)	(0.6-1.2)	(7.7-9.5)
25-44	**7.9%**	**17.9%**	**0.8%**	**6.6%**
	(7.3-8.6)	(17.0-18.9)	(0.7-1.1)	(6.0-7.3)
45-64	**8.1%**	**20.0%**	**0.9%**	**7.3%**
	(7.7-8.7)	(19.5-21.0)	(0.7-1.1)	(6.8-7.8)
65+	**5.6%**	**27.8%**	**0.5%**	**6.3%**
	(5.2-6.1)	(26.7-29.0)	(0.4-0.7)	(5.7-6.9)
Education				
Less than High School Degree	**7.4%**	**23.1%**	**0.9%**	**7.1%**
	(6.4-8.5)	(22.0-24.2)	(0.6-1.5)	(6.5-7.7)
High School Degree	**6.1%**	**20.6%**	**0.5%**	**6.9%**
	(5.8-6.5)	(19.7-21.5)	(0.4-0.7)	(6.4-7.5)
University Degree	**9.6%**	**22.7%**	**1.3%**	**8.8%**
	(9.0-10.2)	(21.5-24.0)	(1.1-1.5)	(7.9-9.7)
Employment				
Employed	**8.0%**	**16.4%**	**0.9%**	**6.6%**
	(7.4-8.5)	(15.7-17.0)	(0.8-1.0)	(6.2-7.0)
Not in Workforce or Unemployed	**7.1%**	**24.1%**	**0.6%**	**8.1%**
	(6.8-7.5)	(23.4-24.7)	(0.5-0.8)	(7.7-8.5)
Income				
Lowest Quartile	**8.8%**	**23.1%**	**0.8%**	**8.1%**
	(8.2-9.6)	(22.1-24.1)	(0.6-1.0)	(7.4-8.8)
Second Quartile	**6.0%**	**19.6%**	**0.8%**	**7.4%**
	(5.5-6.6)	(18.7-20.4)	(0.7-1.0)	(6.8-7.9)
Third Quartile	**7.1%**	**18.7%**	**1.0%**	**7.5%**
	(6.5-7.6)	(17.9-19.6)	(0.8-1.2)	(7.0-8.0)
Highest Quartile	**7.4%**	**18.4%**	**1.2%**	**7.0%**
	(6.9-9.0)	(17.1-19.8)	(1.0-1.5)	(7.3-7.8)
Number of Cars				
No car	**22.5%**	**28.6%**	**1.4%**	**11.4%**
	(20.2-25.0)	(26.7-30.6)	(0.9-2.0)	(10.1-13.0)
One car	**7.7%**	**21.6%**	**0.9%**	**8.0%**
	(7.1-8.4)	(21.0-22.3)	(0.7-1.1)	(7.5-8.4)
Two cars	**6.5%**	**17.4%**	**1.0%**	**5.7%**
	(6.1-7.0)	(16.7-18.0)	(0.9-1.2)	(5.4-6.1)
Three or More Cars	**5.3%**	**13.3%**	**0.8%**	**4.9%**
	(4.9-5.7)	(12.3-14.4)	(0.7-0.9)	(4.2-5.6)
Urban vs. Rural				
Urban	**8.3%**	**21.3%**	**1.0%**	**8.1%**
	(8.0-8.7)	(20.8-21.9)	(0.9-1.2)	(7.7-8.5)
Rural	**4.2%**	**17.9%**	**0.6%**	**5.6%**
	(3.8-4.6)	(17.1-18.7)	(0.5-0.7)	(5.1-6.1)

[a] Excludes children younger than 5 years.
[b] Differences between countries were statistically significant at $P<0.05$ for all population subgroups.
Source: Calculated by the authors based on NHTS 2009 Version 2.0 and MiD 2008.