

Bicycle Research between Bicycle Policies and Bicycle Culture

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After the Second World War, the bicycle was surpassed by the car as the dominant mode of individual transportation in most Western countries. Since the 1970s, however, bicycle use has again gained some support both from the general public and from governments. In the last two decades national governments and cities throughout the Western world, from Norway to Australia and the United States to Germany, as well as the European Union, have launched policy statements and programs aimed at promoting cycling. Policy documents show much optimism about the possibilities to increase the bike's modal share in transport by means of infrastructural and social engineering. These policy plans have enhanced social scientific and traffic engineering research into bicycle use and its facilitation.

Yet basic assumptions of current cycling policies and policy-oriented bicycle research are open to question. Analysis of more than two hundred published research papers and of several national policy documents, most published in the last two decades, cast into doubt whether and to what extent policies have contributed to the rising cycling levels of these years.¹ It is striking that the greater part of bicycle research has been carried out in English-speaking countries (the United States, the United Kingdom, and Australia), where bicycle use is low, but Dutch, German, Belgian, Danish, and other Scandinavian scholars are also prominent. The main question in this research is why people use or don't use the bicycle for utilitarian purposes and, consequently, how cycling can be promoted. It is not clear if bicycle policies drove the rising modal split of the bicycle—or if policies were a response to a growing number of cyclists. Many researchers have suggested that the success of policy efforts to increase bicycling largely depends on national and local contexts.

1. Within the confines of this article I can refer only to a selection of these studies and documents.



The policy rhetoric and the arguments reinforcing cycling policies are largely similar in most countries. They present the bike as an efficient, inexpensive, clean, and convenient solution for traffic congestion, cramped town centers, suburban sprawl, environmental and noise pollution, depletion of energy reserves, public health problems, feelings of insecurity in public spaces, social exclusion, and the loss of social cohesion.² The implementation of the policy plans and the

2. Ministerie van Verkeer en Waterstaat, *Nota Fietsverkeer 1983: Een volledig beeld* (The Hague: Ministerie van Verkeer en Waterstaat, 1983); European Commission, *Policy and Provision for Cyclists in Europe* (Brussels: European Commission, 1989); M. D. Lowe, *The Bicycle: Vehicle for a Small Planet*, Worldwatch Paper 30 (Washington, D.C.: World Watch Institute, 1989); M. D. Lowe, *Alternatives to the Automobile: Transport for Livable Cities* (Washington, D.C.: Worldwatch Institute, 1990); Ministerie van Verkeer en Waterstaat, *Beleidsnotitie Masterplan Fiets* (The Hague: Ministerie van Verkeer en Waterstaat, 1991); Federal Highway Administration, *The FHWA National Bicycling and Walking Study Case Study No. 3: What Needs to Be Done to Promote Bicycling and Walking?* (Washington, D.C.: Federal Highway Administration, 1992); British Medical Association, *Cycling Towards Health and Safety* (Oxford: Oxford University Press, 1992); M. Hillman, *Cycling towards Health and Safety (a Report for the British Medical Association)* (Oxford: Oxford University Press, 1992); Federal Highway Administration, *The FHWA National Bicycling and Walking Study Case Study No. 4: Measures to Overcome Impediments to Bicycling and Walking* (Washington, D.C.: Federal Highway Administration, 1993); Finnish Ministry of Transport, *Finland Moving on Two Wheels* (Helsinki: Finnish Ministry of Transport, 1993); U.S. Department of Transportation/Federal Highway Administration, *The National Bicycling and Walking Study: Transportation Choices for a Changing America* (Washington, D.C.: U.S. Department of Transportation/Federal Highway Administration, 1994); Department of Transport, *National Cycling Strategy* (London: Department of Transport, 1996); Bundesministerium für Verkehr, Bau- und Wohnungswesen, *Erster Bericht der Bundesregierung über die Situation des Fahrradverkehrs in der Bundesrepublik Deutschland* (Bonn: Bundesministerium für Verkehr, Bau- und Wohnungswesen, 1998); Ministerie van Verkeer en Waterstaat, *Final Report Masterplan Bike: Summary, Evaluation and an Overview of Projects in the Framework of Masterplan Bike 1990-1997* (The Hague: Ministerie van Verkeer en Waterstaat, 1998); Federal Highway Administration, *The National Bicycling and Walking Study: Five Years Status Report by the U.S. Department of Transportation* (Washington, D.C.: Federal Highway Administration, 1999); U.S. Department of Transportation/Federal Highway Administration, *Design Guidance: Accommodating Bicycle and Pedestrian Travel: A Recommended Approach: A US DOT Policy Statement on Integrating Bicycling and Walking into Transportation Infrastructure* (Washington, D.C.: U.S. Department of Transportation/Federal Highway Administration, 2000); Directorate-General for Passenger Transport, *The Dutch Bicycle Master Plan: Description and Evaluation in a Historical Context* (The Hague: Ministry of Transport, Public Works and Water Management, 1999); Ministry of Transport, Denmark, *Promoting Safer Cycling: A Strategy* (Copenhagen: Ministry of Transport, 2000); Department of Transport, *Ten Year Transport Plan* (London: Department of Transport, 2000); European Commission, *Promotion of Measures for Vulnerable Road Users: Measures to Promote Cyclist Safety and Mobility* (Brussels: European Commission, 2001); Bundesministerium für Verkehr, Bau- und Wohnungswesen, *Nationaler Radverkehrsplan 2002-2012, FahrRad! Massnahmen zur Förderung des Radverkehrs in Deutschland* (Berlin: Bundesministerium für Verkehr, Bau- und Wohnungswesen, 2002); Ministerie van de Vlaamse Gemeenschap, Departement van Leefmilieu en Infrastructuur, *Ontwerp Vlaams Totaalplan Fiets* (Brussels: Departement Leefmilieu en

actual modal share of the bicycle in passenger transport, however, persistently vary between countries, regions, and cities. About the year 2000, the bicycle's modal split amounted to 27 percent in the Netherlands and 20 percent in Denmark. It varied between 7 and 12 percent in Germany, Belgium, Austria, Switzerland, Sweden, and Finland; between 4 and 5 percent in Italy, France, and Norway; and between 2 and 3 percent in Great Britain, Canada, Ireland, and the Czech Republic. It stagnated around 1 percent in the United States, Australia, New Zealand, Spain, Portugal, Greece, and Luxemburg.³ Data about bicycle ownership, the

Infrastructuur, 2002); Mobile Flanders, *Flemish Cycling Plan* (Brussels: Department Mobility and Public Transport, 2002); City of Copenhagen, *Cycle Policy 2002–2012* (Copenhagen: City of Copenhagen, Building and Construction Administration, Roads and Parks Department, 2002); Ministry of Transport and Communications, Finland, *Towards Healthy, Sustainable Transportation: Implementation of the WHO London Charter in Finland* (Helsinki: Ministry of Transport and Communications, 2002); World Health Organisation, *Physical Activity through Transport As Part of Daily Activities* (Copenhagen: World Health Organisation, 2002); Norwegian Public Roads Administration, *National Cycling Strategy: Making Cycling Safe and Attractive, National Transport Plan 2006–2015* (Oslo: Norwegian Public Roads Administration, 2003); Department for Transport, *Walking and Cycling: An Action Plan* (London: Department for Transport, 2004); Federal Highway Administration, *The National Bicycling and Walking Study* (Washington, D.C.: Federal Highway Administration, 2004); European Conference of the Ministers of Transport, *Implementing Sustainable Urban Travel Policies: National Policies to Promote Cycling* (Paris: Organisation for Economic Co-operation and Development, 2004); Transport for London, *Creating a Chain Reaction: The London Cycling Action Plan* (London: Transport for London, 2004); U.S. Department of Transportation, *The National Bicycling and Walking Study: A Ten-Year Status Report* (Washington, D.C.: U.S. Department of Transportation/Federal Highway Administration/Pedestrian and Bicycle Information Center, 2004); G. Lind, ed., *Cost Benefit Analysis of Cycling* (Copenhagen: Tema Nord, Nordic Council, 2005); Austroads Incorporated, *The Australian National Cycling Strategy 2005–2010* (Sydney: Austroads, 2005); Dutch Bicycling Council/Fietsberaad, *Continuous and Integral: The Cycling Policies of Groningen and Other European Cycling Cities* (Amsterdam: Fietsberaad, 2006); Department of Transport, *A Sustainable Future for Cycling* (London: Department of Transport, 2008); Transport for London, *Cycling in London: Final Report* (London: Transport for London, 2008); Department of Transport, *Ireland's First National Cycle Policy Framework* (Dublin: Department of Transport, 2009); Australian Bicycle Council/Austroads, *The Australian National Cycling Strategy 2011–2016: Gearing Up for Active and Sustainable Communities* (Sydney: Austroads Ltd., 2010); Directorate-General for Internal Policies, Policy Department B, Structural and Cohesion Policies, *The Promotion of Cycling* (Brussels: European Parliament, 2010); U.S. Department of Transportation, *The National Bicycling and Walking Study: 15-Year Status Report* (Washington, D.C.: U.S. Department of Transportation/Federal Highway Administration/Pedestrian and Bicycle Information Center, 2010); U.S. Department of Transportation, *Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations* (Washington, D.C.: U.S. Department of Transportation, 2010); National Association of City Transportation Officials, *Cities for Cycling* (Washington, D.C.: National Association of City Transportation Officials, 2010); League of American Bicyclists, *Bicycling Friendly Community Program* (Washington, D.C.: League of American Bicyclists, 2010).

3. U. Huwer, "The 10 Point Pedalling Action Programme to Support Cycling," *World Transport Policy & Practice* 6, no. 2 (2000): 40–44, here: 41; European Conference of the Ministers of

distance traveled by bike per capita, the frequency of bicycle use, and the appreciation of the bike as a means of transport also show considerable differences.⁴

The success or failure of cycling policies can largely be attributed to differences in bicycle cultures that are rooted in history. These cultures endow cycling and its social context with collective meanings. Because such cultural factors evolved in long-term historical trajectories, they resist rational considerations and (short-term) social planning. History and culture limit what cycling policies can realize. For bicycle research this implies that both cultural-historical issues and policy-making processes regarding cycling deserve closer investigation. International-comparative and historical research into bicycling can be used to evaluate national bicycle policies. Historical and cultural factors have been neglected in social scientific and traffic engineering research. The following review of research proposes to bridge the gap between bicycle policies and the associated research on the one hand, and cultural and historical research into bicycling on the other.

In the last three decades, many Western governments have grown interested in the bike as a useful means of transport. Consequent policy making has advanced cycling as a subject of research in transport, traffic, infrastructure, and urban planning. Quantitative and statistical research methods, in particular surveys, predominate. A review of the research indicates that the following six factors encourage or constrain cycling:

1. Natural conditions
2. Spatial and urban features
3. Demography
4. Culture
5. Traffic infrastructure
6. Attitudes

Transport, *Implementing Sustainable Urban Travel Policies*, 19–20, 24; K. van Hout, *Literature Search Bicycle Use and Influencing Factors in Europe* (Hasselt: Universiteit Hasselt/Instituut voor Mobiliteit, 2008), 14–15; J. Pucher and R. Buehler, “Making Cycling Irresistible: Lessons from the Netherlands, Denmark and Germany,” *Transport Reviews* 28, no. 4 (2008): 495–528, here: 498; Directorate-General for Internal Policies, *The Promotion of Cycling*, 28; “Bicycle Statistics: Usage, Production, Sales, Import, Export,” <http://www.ibike.org/library/statistics-data.htm> (accessed 19 December 2012).

4. J. Dekoster et al., *Cycling: The Way Ahead for Towns and Cities* (Luxembourg: Office for the Official Publications of the European Communities, 1999), 19; Huwer, “The 10 Point Pedaling Action Programme,” 43; European Conference of the Ministers of Transport, *Implementing Sustainable Urban Travel Policies*, 20; P. Rietveld and V. Daniel, “Determinants of Bicycle Use: Do Municipal Policies Matter?,” *Transportation Research Part A: Policy and Practice* 38 (2004): 531–550, here: 534; van Hout, *Literature Search Bicycle Use*, 8, 16–18; Pucher and Buehler, “Making Cycling Irresistible,” 499; “Bicycle Statistics,” <http://www.ibike.org/library/statistics-data.htm>.

The first four of these cannot be changed through direct human intervention, at least not in the short term. They largely depend on the forces of nature (1 and 3) or they have taken on a more or less fixed shape in historical trajectories (2, 3, and 4). The last two, on the other hand, can in principle be directly influenced through policy measures. After a brief review of the main results of bicycle research relevant to the first four factors, attention will turn to the two last factors. A consideration of the role of culture will conclude the article.

Natural conditions (climate, weather, and geography, and especially differences in altitude) affect bicycle use, but they don't seem to have a decisive influence, and perhaps even play a subordinate role.⁵ Spatial and urban characteristics refer to the density of population and the built environment, the degree of (sub)urbanization, the separation or mixing of different urban functions such as living and working, the spatial spread of private, public, and commercial facilities, and the availability, efficiency, and attractiveness of various modes of transport (public transport, car, moped, bicycle, walking). Positive correlations between urban density and cycling levels have been established, but they are not equally significant in various cities and countries, and they seem to depend on other factors such as the convenience of public transport. There are indica-

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5. M. J. Koetse and P. Rietveld, *The Impact of Climate Change and Weather on Transport: An Overview of Empirical Findings* (Amsterdam: Department of Spatial Economics, Free University, n.d.); P. Emmerson, T. Ryley, and D. G. Davies, "The Impact of Weather on Cycle Flows," *Traffic Engineering and Control* 39, no. 4 (1998): 238–243; M. Nankervis, "The Effect of Weather and Climate on Bicycle Commuting," *Transportation Research Part A: Policy and Practice* 33 (1999): 417–431; A. J. Richardson, *Seasonal and Weather Impacts on Urban Cycling Trips*, TUTI Report 1-2000 (Victoria: The Urban Transport Institute, 2000); A. Bergström and R. Magnusson, "Potential of Transferring Car Trips to Bicycle during Winter," *Transportation Research Part A: Policy and Practice* 37, no. 8 (2003): 649–666; C. Brandenburg, A. Matzarakis, and A. Arnberger, "The Effects of Weather on Frequencies of Use by Commuting and Recreation Bicyclists," in *Advances in Tourism Climatology*, vol. 12, ed. A. Matzarakis, C. R. De Freitas, and D. Scott (Freiburg: Meteorologisches Institut der Universität Freiburg, 2004), 189–197; J. Pucher and R. Buehler, "Why Canadians Cycle More Than Americans: A Comparative Analysis of Bicycling Trends and Policies," *Transport Policy* 13 (2006): 265–79; M. Winters et al., "Utilitarian Bicycling: A Multilevel Analysis of Climate and Personal Influences," *American Journal of Preventive Medicine* 32, no. 1 (2007): 52–58; C. Brandenburg, A. Matzarakis, and A. Arnberger, "Weather and Cycling: A First Approach to the Effects of Weather Conditions on Cycling," *Meteorological Applications* 14 (2007): 61–67; M. Sabir, M. J. Koetse, and P. Rietveld, "The Impact of Weather Conditions on Mode Choice Decisions: Empirical Evidence for the Netherlands," Tinbergen Institute Discussion Paper (Amsterdam: VU University, 2008); E. Heinen, B. van Wee, and K. Maat, "Commuting by Bicycle: An Overview of the Literature," *Transport Reviews* 30, no. 1 (2010): 59–96; M. Winters et al., "Motivators and Deterrents of Bicycling: Factors Influencing Decisions to Ride," *Transportation* 38, no. 1 (2012): 153–168, doi:10.1007/s11116-010-9284-y; T. Krag, "Bicycle Promotion Strategies in Denmark," http://www.Friedefugle.dk/poland/promotion_tk_en.html (accessed 2 February 2012); T. Thomas, C. F. Jaarsma, and S. I. A. Tutert, "Temporal Variations of Bicycle Demand in the Netherlands: The Influence of Weather on Cycling" (unpublished paper, 2008).

tions that such spatial and urban attributes have more influence than natural conditions.⁶

In some countries there is a significant correlation between the bike's modal share and demographic, socioeconomic, and sociocultural characteristics (age, sex, income, education, religion, family composition, lifestyle, ethnicity, and political affiliation), but in other countries such a correlation is weak or almost nonexistent. Whereas in the United States, Canada, Great Britain, and Australia men, youngsters, and students are overrepresented among cyclists, and also in France and Belgium more men than women cycle, in the Netherlands, Denmark, and Germany there is a stronger correspondence between the demographic traits

6. K. Shafizadeh and D. Niemeier, "Bicycle Journey-to-Work: Travel Behavior Characteristics and Spatial Analysis," *Transportation Research Record* 1578 (1997): 84–90; Ministerie van Verkeer en Waterstaat, *Final Report Masterplan Bike*; T. Schwanen, "Urban Form and Commuting Behavior: A Cross European Comparison," *Tijdschrift voor Economische en Sociale Geografie* 93, no. 3 (2002): 336–343; B. E. Saelens, J. F. Sallis, and L. D. Frank, "Environmental Correlates of Walking and Cycling: Findings From the Transportation, Urban Design, and Planning Literatures," *Annals of Behavioral Medicine* 25, no. 2 (2003): 80–91; R. Cervero, "The Built Environment and Travel: Evidence from the United States," *European Journal of Transport and Infrastructure Research* 3, no. 2 (2003): 119–137; R. Cervero and M. Duncan, "Walking, Bicycling, and Urban Landscapes: Evidence From the San Francisco Bay Area," *American Journal of Public Health* 93, no. 9 (2003): 1478–1483; F. M. W. Bax, "Bicycle Use in the Netherlands versus the United States" (master's thesis, Rijksuniversiteit Groningen, 2004); Rietveld and Daniel, "Determinants of Bicycle Use"; A. Moudon et al., "Cycling and the Built Environment, a US Perspective," *Transportation Research Part D: Transport and Environment* 10 (2005): 243–261; Pucher and Buehler, "Why Canadians Cycle More Than Americans"; J. D. Hunt and J. E. Abraham, "Influences on Bicycle Use," *Transportation* 34, no. 4 (2007): 453–470; J. Y. Guo, C. R. Bhat, and R. B. Copperman, "Effect of the Built Environment on Motorized and Non-Motorized Trip Making: Substitutive, Complementary, or Synergistic?" (paper presented at the Transportation Research Board annual meeting, Washington, D.C., 2007); S. Zahran et al., "Cycling and Walking: Explaining the Spatial Distribution of Healthy Modes of Transportation in the United States," *Transportation Research Part D: Transport and Environment* 13 (2008): 462–470; K. Krizek, A. Forsyth, and L. Baum, *Walking and Cycling International Literature Review: Final Report* (Melbourne: Department of Transport, State of Victoria, 2009), 6; J. C. Xinyu, P. L. Mokhtarian, and S. L. Handy, "Examining the Impacts of Residential Self-Selection on Travel Behaviour: A Focus on Empirical Findings," *Transport Reviews* 29, no. 3 (2009): 359–395; Heinen, van Wee, and Maat, "Commuting by Bicycle"; R. Ewing and R. Cervero, "Travel and the Built Environment: A Meta-Analysis," *Journal of the American Planning Association* 76, no. 3 (2010): 265–294; M. Winters et al., "Built Environment Influences on Healthy Transportation Choices: Bicycling versus Driving," *Journal of Urban Health* 87, no. 6 (2010): 969–993; J. Scheiner, "Interrelations between Travel Mode Choice and Trip Distance: Trends in Germany 1976 to 2002," *Journal of Transport Geography* 18, no. 1 (2010): 75–84; P. Pelzer, "Bicycling As a Way of Life: A Comparative Case Study of Bicycle Culture in Portland and Amsterdam" (master's thesis, University of Amsterdam, 2010); G. Vandenbulcke et al., "Cycle Commuting in Belgium: Spatial Determinants and 'Re-cycling' Strategies," *Transportation Research Part A: Policy and Practice* 45, no. 2 (2011): 118–137.

of cyclists and those of the general population. Correlations between bicycle use and education, wealth, income, family situation, religion, and ethnicity are not straightforward and vary between countries.⁷ Some researchers suggest that cy-

7. I. N. Sener, N. Eluru, and C. R. Bhat, "An Analysis of Bicyclists and Bicycling Characteristics: Who, Why, and How Much are they Bicycling?" (paper presented at the 88th annual meeting of the Transportation Research Board, Washington, D.C., s.a.); G. B. Rodgers, "The Characteristics and Use Patterns of Bicyclists in the United States," *Journal of Safety Research* 25, no. 2 (1994): 83–96, here: 86–88; M. R. Baltes, "Factors Influencing Nondiscretionary Work Trips by Bicycle Determined from 1990 U.S. Census Metropolitan Statistical Area Data," *Transportation Research Record* 1538 (1996): 96–101; W. E. Moritz, "A Survey of North American Bicycle Commuters: Design and Aggregate Results," *Transport Research Record* 1578 (1997): 91–101, here: 98; J. Pucher, "Bicycling Boom in Germany: A Revival Engineered by Public Policy," *Transportation Quarterly* 51, no. 4 (1997): 31–46; J. Pucher, C. Komanoff, and P. Schimeck, "Bicycling Renaissance in North America? Recent Trends and Alternative Policies to Promote Bicycling," *Transportation Research Part A: Policy and Practice* 33 (1999): 625–654, here: 629; Ministerie van Verkeer en Waterstaat, Directoraat-Generaal Personenvervoer, *Eindrapport Masterplan Fiets: Samenvatting, evaluatie en overzicht van de projecten in het kader van het Masterplan Fiets, 1990–1997* (The Hague: Ministerie van Verkeer en Waterstaat, 1998), 45; C. G. Pooly and J. Turnbull, "Modal Choice and Modal Change: The Journey to Work in Britain since 1890," *Journal of Transport Geography* 8 (2000): 11–24, here: 14–15, 19; City of Copenhagen, *Cycle Policy 2002–2012*; Rietveld and Daniel, "Determinants of Bicycle Use"; R. Ververs and A. Ziegelaar, *Verklaringsmodel voor fietsgebruik gemeenten: Eindrapport* (Leiden: Research voor beleid bv, 2006); H. Nijland and B. van Wee, "De baten van fietsen en de mogelijkheden van fietsbeleid" (paper presented at the Colloquium Vervoersplanologisch Speurwerk, Amsterdam, 2006) [Please provide day and month of the conference]; J. Parkin, T. Riley, and T. Jones, "On Barriers to Cycling: An Exploration of Quantitative Analyses," in *Cycling and Society*, ed. D. Horton, P. Rosen, and P. Cox (London: Ashgate, 2007), 83–96; Winters et al., "Utilitarian Bicycling"; J. Scheiner and C. Holz-Rau, "Travel Mode Choice: Affected by Objective or Subjective Determinants?," *Transportation* 34 (2007): 487–511; J. Scheiner, "Mobility Biographies: Elements of a Biographical Theory of Travel Demand," *Erdkunde* 61 (2007): 161–173; B. de Geus et al., "Psychosocial and Environmental Factors Associated with Cycling for Transport among a Working Population," *Health Education Research* 23, no. 4 (2007): 697–708; van Hout, *Literature Search Bicycle Use*; J. Parkin, M. Wardman, and M. Page, "Estimation of the Determinants of Bicycle Mode Share for the Journey to Work Using Census Data," *Transportation* 35, no. 1 (2008): 93–109; Transport for London, *Cycling in London*, 1, 8–11, 41, 45; J. Garrard, G. Rose, and S. K. Lo, "Promoting Transportation Cycling for Women: The Role of Bicycle Infrastructure," *Preventive Medicine* 46 (2008): 55–59; C. Emond, W. Tang, and S. Handy, "Explaining Gender Difference in Bicycling Behavior," *Transportation Research Record* 2125 (2009): 16–25; Fietsberaad, *Fietsberaadfactsheet 1* (Rotterdam: Fietsberaad, 2009), 2; Pucher and Buehler, "Making Cycling Irresistible," 504; Heinen, van Wee, and Maat, "Commuting by Bicycle"; R. Verhoeven and P. M. Schrijnen, "Allochtonen onderweg: Fietsgebruik onder immigranten" (paper presented at the Colloquium Vervoersplanologisch Speurwerk, Roermond, Netherlands, 25–26 Nov. 2010); P. Pelzer, "Fietsmulticulturalisme," *Agora: Magazine voor sociaalruimtelijke vraagstukken* 26, no. 4 (2010): 17–19; F. Goetzke and T. Rave, "Bicycle Use in Germany: Explaining Differences between Municipalities with Social Network Effects," *Urban Studies* 48, no. 2 (2011): 427–437; J. Pucher, R. Buehler, and M. Seinen, "Bicycle Renaissance in North America? An Update and Re-appraisal of Cycling

cling rates are correlated with degrees of social egalitarianism and status sensitivity, and to certain lifestyles.⁸

The cultural context determines the habits in the field of transport and mobility in general and in bicycling in particular. The influence of ingrained habit is touched upon in social science research, but it is hardly analyzed. Traffic systems and infrastructures have received much more attention in policy-oriented bicycle research. Bicycling may be influenced by traffic rules for motorized and bicycle traffic, traffic speeds, degree of segregation between cars and bikes and between cyclists and pedestrians, and parking availability and costs for both cars and bicycles. Also important are the availability of bicycle paths, lanes, bridges, viaducts, tunnels, traffic-calmed streets and other bicycle facilities such as marked routes and route networks, separate traffic lights, and (guarded) parking lots. Furthermore, changing rooms and showers in the workplace, storage capacity for bikes at home, repair shops, bike rental facilities, public transit service, and the costs and taxation of various modes of transport matter.

Existing traffic systems and infrastructure can be modified to accommodate cyclists. Some bicycle researchers—particularly Americans—display an unshakable optimism that infrastructure and policies can promote bicycling for transport by making it safe, efficient, comfortable, and pleasant. The American professor of urban planning John Pucher, for example, contends that “bicycling can be increased even under quite unfavorable circumstances, provided the right public policies are implemented.”⁹ The same optimism is typically expressed by a slogan used in the titles of two articles by American researchers: “If You Build Them, Commuters Will Use Them.”¹⁰ Several American researchers and activists

Trends and Policies,” *Transportation Research Part A: Policy and Practice* 45 (2011): 451–475, here: 454–458; J. Pucher et al., “Walking and Cycling in the United States: Evidence from the National Household Travel Surveys,” *American Journal of Public Health* 101, no. 1 (2011): 310–317, here: 312–313; Vandenbulcke et al., “Cycle Commuting in Belgium.”

8. De Geus et al., “Psychosocial and Environmental Factors”; P. Cox, “Class and Competition: The Gentrification of Sport Cycling” (paper presented at the 5th annual cycling and society symposium UWE, 2008) [Please provide place of symposium and also the day and month]; Pelzer, “Bicycling As a Way of Life,” 31, 61, 91; G. Kuipers, *De fiets van Hare Majesteit: Over nationale habitus en sociologische vergelijking*, Oratie Erasmus Universiteit (Rotterdam: Erasmus Universiteit, 2010); E. Heinen, “Attitudes van de fietsforens,” *Agora: Magazine voor sociaal-ruimtelijke vraagstukken* 26, no. 4 (2010): 14–16; Vandenbulcke et al., “Cycle Commuting in Belgium,” 121.
9. Pucher, “Bicycling Boom in Germany,” 44; Lowe, *The Bicycle*, 31, 39–40.
10. A. C. Nelson and D. Allen, “If You Build Them, Commuters Will Use Them: The Association between Bicycle Facilities and Bicycle Commuting,” *Transportation Research Record* 1578 (1997): 79–83; J. Dill and T. Carr, “Bicycle Commuting and Facilities in Major U.S. Cities: If You Build Them, Commuters Will Use Them—Another Look,” *Transportation Research Record* 1828 (2003): 116–123; Pucher, Buehler, and Seinen, “Bicycle Renaissance in North America?,” 464, 471.

advocate the adoption of European—in particular Danish, Dutch, and German—bicycle policies in the United States.¹¹

To find out whether infrastructural adjustments and facilities indeed have encouraged cycling, many researchers have investigated those who use them and to what extent they do so. Some of them have established a positive correlation between the availability and quality of bicycle routes and networks and the modal share of the bicycle, but only under specific conditions and not for all user groups.¹² Yet researchers have also questioned the assumption that infrastructure

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11. J. Pucher, "Urban Travel Behavior As the Outcome of Public Policy: The Example of Modal-split in Western Europe and North America," *Journal of the American Planning Association* 54, no. 4 (1988): 509–520; J. Pucher and L. Dijkstra, "Making Walking and Cycling Safer: Lessons from Europe," *Transportation Quarterly* 54, no. 3 (2000): 25–50; J. Pucher and L. Dijkstra, "Promoting Safe Walking and Cycling to Improve Public Health: Lessons from the Netherlands and Germany," *American Journal of Public Health* 93, no. 9 (2003): 1509–1516; Pucher and Buehler, "Making Cycling Irresistible"; J. Pucher and R. Buehler, "At the Frontiers of Cycling: Policy Innovations in the Netherlands, Denmark, and Germany," *World Transport Policy* 1313 (2008): 8–57; Lowe, *The Bicycle*, 6, 10, 35; C. Reynolds et al., "The Impact of Transportation Infrastructure on Bicycling Injuries and Crashes: A Review of the Literature," *Environmental Health* 8, no. 47 (2009).
 12. C. L. Antonakos, "Environmental and Travel Preferences of Cyclists," *Transport Research Record* 1438 (1994): 25–33; R. B. Noland and H. Kunreuther, "Short-Run and Long-Run Policies for Increasing Bicycle Transportation for Daily Commuter Trips," *Transport Policy* 2, no. 1 (1995): 67–79; Shafizadeh and Niemeier, "Bicycle Journey-to-Work"; Dill and Carr, "Bicycle Commuting and Facilities in Major U.S. Cities"; M. A. Stinson and C. R. Bhat, "Commuter Bicyclist Route Choice: Analysis Using a Stated Preference Survey," *Transportation Research Record* 1828 (2003): 107–115; T. Pikora et al., "Developing a Framework for Assessment of the Environmental Determinants of Walking and Cycling," *Social Science and Medicine* 56, no. 8 (2003): 1693–1703; J. E. Dickonson et al., "Employer Travel Plans, Cycling and Gender: Will Travel Plan Measures Improve the Outlook for Cycling to Work in the UK?," *Transportation Research Part D: Transport and Environment* 8, no. 1 (2003): 53–67; M. A. Stinson and C. R. Bhat, "Frequency of Bicycle Commuting: Internet-Based Survey Analysis," *Transportation Research Record* 1878 (2004): 122–130; K. J. Krizek, P. J. Johnson, and N. Tilahun, "Gender Differences in Bicycling Behavior and Facility Preferences," in *Conference Proceedings 35, Research on Women's Issues in Transportation Volume 2: Technical Papers* (Chicago, IL: Transportation Research Board of the National Academies, 2004); Rietveld and Daniel, "Determinants of Bicycle Use"; Hunt and Abraham, "Influences on Bicycle Use"; M.-J. Olde Kalter, *Vaker op de fiets? Effecten van overheidsmaatregelen* (The Hague: Kennisinstituut voor Mobiliteitsbeleid, 2007); N. Y. Tilahun, D. M. Levinson, and K. J. Krizek, "Trails, Lanes, or Traffic: Valuing Bicycle Facilities with an Adaptive Stated Preference Survey," *Transportation Research Part A: Policy and Practice* 41, no. 4 (2007): 287–301; van Hout, *Literature Search Bicycle Use*; D. Cohen et al., "Impact of New Bicycle Path on Physical Activity," *Preventive Medicine* 46 (2008): 80–81; I. M. Bernhoft and G. Carstensen, "Preferences and Behaviour of Pedestrians and Cyclists by Age and Gender," *Transportation Research Part F: Traffic Psychology and Behaviour* 11, no. 2 (2008): 83–95; Garrard, Rose, and Lo, "Promoting Transportation Cycling for Women"; Transport for London, *Cycling in London*; K. J. Krizek, G. Barnes, and K. Thompson, "Analyzing the Effect of Bicycle Facilities on Commute Mode Share over Time," *Journal of Ur-*

policies promote cycling. The impact is difficult to determine. Many researchers find a correlation between cycle paths (and similar provisions) and bicycle traffic volume, but this does not establish a causal link. Instead of augmenting cycling levels, infrastructure improvements may be a result of a preceding rise of the bicycle's modal share. A growing number of cyclists may entail growing demand for facilities and consequent government efforts to meet it—in particular if the demand is articulated by bicycle activists and lobbyists. Self-selection applies: individuals who want to cycle for routine transport may prefer to settle in a bicycle-friendly environment.¹³ One American study even concludes that there is no clear evidence of a correlation between infrastructure and bicycling levels, and that demographic factors are far more important. The authors claim “that people who cycle do so irrespective of a supportive transportation infrastructure. Such commonly accepted route-related correlates of cycling as bike lane, traffic conditions, and street connectivity ... remain insignificant.”¹⁴

Some American and British longitudinal studies comparing cycling levels before and after installation of new bike facilities show that the new infrastructure did not induce substantial growth in (utilitarian) cycling. Modest increases—

ban Planning and Development 135, no. 2 (2009): 66–73; Krizek, Forsyth, and Baum, *Walking and Cycling International Literature Review*; Parkin, Riley, and Jones, “On Barriers to Cycling”; G. Akar and K. Clifton, “The Influence of Individual Perceptions and Bicycle Infrastructure on the Decision to Bike,” *Transportation Research Record* 2140 (2009): 165–172; C. Emond, W. Tang, and S. Handy, “Explaining Gender Difference in Bicycling Behavior,” *Transportation Research Record* 2125 (2009): 16–25; Winters et al., “Motivators and Deterrents of Bicycling”; J. Dill, “Bicycling for Transportation and Health: The Role of Infrastructure,” *Journal of Public Health Policy* 30, no. 1 (2009): 95–110; Heinen, van Wee, and Maat, “Commuting by Bicycle”; Pucher, Dill, and Handy, “Infrastructure, Programs, and Politics to Increase Bicycling”; G. Menghini et al., “Route Choice of Cyclists in Zurich,” *Transportation Research Part A: Policy and Practice* 9 (2010): 754–765; S. Christmas et al., *Cycling, Safety and Sharing the Road: Qualitative Research with Cyclists and Other Road Users*, Road Safety Web Publication 17 (London: Department for Transport, 2010); J. Larsen and A. El-Geneidy, “A Travel Behavior Analysis of Urban Cycling Facilities in Montréal Canada,” *Transportation Research Part D: Transport and Environment* 16, no. 2 (2011): 172–177.

13. Baltes, “Factors Influencing Nondiscretionary Work Trips by Bicycle”; Nelson and Allen, “If You Build Them, Commuters Will Use Them”; Pucher, Komanoff, and Schimeck, “Bicycling Renaissance in North America?”; Dill and Carr, “Bicycle Commuting and Facilities in Major U.S. Cities”; G. Barnes and K. J. Krizek, “Estimating Bicycling Demand,” *Transportation Research Record* 1939 (2005): 45–51; Parkin, Wardman, and Page, “Estimation of the Determinants of Bicycle Mode Share”; Krizek, Barnes, and Thompson, “Analyzing the Effect of Bicycle Facilities on Commute Mode Share over Time”; Krizek, Forsyth, and Baum, *Walking and Cycling International Literature Review*; K. J. Krizek, S. Handy, and A. Forsyth, “Explaining Changes in Walking and Bicycling Behavior: Challenges for Transportation Research,” *Environment and Planning B: Planning and Design* 36 (2009): 725–740; Heinen, van Wee, and Maat, “Commuting by Bicycle”; Pucher, Dill, and Handy, “Infrastructure, Programs, and Politics to Increase Bicycling.”
14. Moudon et al., “Cycling and the Built Environment,” 259.

especially of recreational cycling—seem to occur only where the bicycle's modal split was already above the national average.¹⁵ German and British researchers found no direct causal link between the volume of routine bicycling and existing infrastructure and cycling policies.¹⁶ Dutch and Danish researchers found that policies clearly increase cycling only if pull measures, such as the construction of bicycle networks, are combined with push measures, such as a substantial rise in parking rates for cars in urban centers.¹⁷

There are indications that Danish, Dutch, and German bicycle policies, which are shining examples for many bicycle advocates, researchers, and urban planners in other countries, have not substantially increased the bike's modal share, but rather have made cycling safer, more efficient, more convenient, and more enjoyable for the fairly large numbers of people who already frequently used the bicycle for utilitarian transport.¹⁸ A similar effect can be observed in promotion campaigns aimed at boosting the bicycle's image: they mainly attract people who already cycle and who don't have to be convinced of the utility and fun of cycling, while their impact on people who rarely or never use a bike is minimal.¹⁹

Such insights may explain the rather limited results of bicycle policies in the English-speaking countries where the bike's modal split is low and cycling for daily transport is uncommon. Conversely, such policies seem to be more or less effective in countries where cycling levels are already relatively high and cycling is a time-honored practice—although the result is not so much a substantial in-

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15. Krizek, Barnes, and Thompson, "Analyzing the Effect of Bicycle Facilities on Commute Mode Share over Time"; F. Cleaveland and F. Douma, "The Impact of Bicycling Facilities on Commute Mode Share" (paper presented at the 88th annual meeting of the Transportation Research Board, Washington, D.C., 2009).
 16. H. Maddox, "Another Look At Germany's Bicycle Boom: Implications for Local Transportation Policy and Planning Strategy in the U.S.A.," *World Transport Policy & Practice* 7, no. 3 (2001): 44–48; Goetzke and Rave, "Bicycle Use in Germany"; see also M. Wachs, "Discussion of 'Bicycling Boom in Germany: A Revival Engineered by Public Policy' by John Pucher (1997)," <http://bostoncriticalmass.org/wachs.htm> (accessed 20 December 2012); M. Jones, "Promoting Cycling in the U.K.: Problems Experienced by the Practitioners," *World Transport Policy & Practice* 7, no. 3 (2001): 7–12; S. Kingham, J. Dickinson, and S. Copsey, "Travelling to Work: Will People Move Out of Their Cars," *Transport Policy* 8, no. 2 (2001): 151–160.
 17. Ministerie van Verkeer en Waterstaat, Directoraat-Generaal Personenvervoer, *Eindrapport Masterplan Fiets*, 34, 40–41; Ververs and Ziegelaar, *Verklaringsmodel voor fietsgebruik gemeenten*; Krag, "Bicycle Promotion Strategies in Denmark"; see also Rietveld and Daniel, "Determinants of Bicycle Use"; Olde Kalter, *Vaker op de fiets?*; Krizek, Forsyth, and Baum, *Walking and Cycling International Literature Review*.
 18. Ministerie van Verkeer en Waterstaat, *Eindrapport Masterplan Fiets*, 41–44, 50–54; Directorate-General for Passenger Transport, *The Dutch Bicycle Master Plan*, 38, 83–84; Krizek, Forsyth, and Baum, *Walking and Cycling International Literature Review*, 37; see also R. Oldenziel and A. Albert de la Bruhèze, "Contested Spaces: Bicycle Lanes in Urban Europe, 1900–1995," *Transfers* 1, no. 2 (2011): 29–49.
 19. Transport for London, *Cycling in London*, 40.

crease in the bicycle's modal share, but a facilitation of existing cycle traffic and a mitigation of technical and social impediments to cycling.²⁰

The available research offers no conclusive evidence that infrastructure and policy innovations substantially augment cycling. Despite them, virtuous circles secure bicycling where it is already common, while vicious circles discourage it where it is rare. Bicycle policies' effects are largely determined by existing cycling volumes and practices, and by prevailing public perceptions of the bicycle. Construction of infrastructure is not futile, but its effects are constrained by other factors influencing bicycle use, including demographics, inhabitants' cycling experiences, attitudes, and habits, and the historically shaped bicycle culture.

Researchers have criticized the often one-sided orientation in bicycle policies to the "hard" material conditions of cycling, particularly infrastructure, and draw attention to the importance of "soft" policy measures such as information, education, instruction, promotion, and marketing.²¹ Policy efforts to improve the image

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20. K. Goeverden and T. Godefrooij, "Ontwikkeling van het fietsbeleid en: Gebruik in Nederland" (paper presented at the Colloquium Vervoersplanologisch Speurwerk, Roermond, Netherlands, 25–26 Nov. 2010); P. Peters, *De haast van Albertine: Reizen in de technologische cultuur: Naar een theorie van passages* (Amsterdam: Uitgeverij De Balie, 2003); L. Harms, *Trends in beleving: Een notitie naar aanleiding van het KiM-rapport "Beleving en beeldvorming van mobiliteit"* (The Hague: Kennisinstituut voor Mobiliteitsbeleid, 2007).
21. M. Wardman, R. Hatfield, and M. Page, "The UK National Cycling Strategy: Can Improved Facilities Meet the Targets?," *Transport Policy* 4, no. 2 (1997): 123–133; C. Porter, J. Suhrbier, and W. L. Schwarz, "Forecasting Bicycle and Pedestrian Travel: State of the Practice and Research Needs," *Transportation Research Record* 1674 (1999): 94–101; Pooley and Turnbull, "Modal Choice and Modal Change"; Jones, "Promoting Cycling in the U.K.," J. Harrison, "Planning for More Cycling: The York Experience Bucks the Trend," *World Transport Policy & Practice* 7, no. 3 (2001): 21–27; P. Rosen, *How Can Research into Cycling Help Implement the National Cycling Strategy? Review of Cycling Research Findings and Needs*, Report of Whitehall Summer Placement in the Department for Transport, CLT3 & CLT4 (York: University of York, Science and Technology Studies Unit, 2003), 30–33; J. Anable and B. Gatersleben, "All Work and No Play? The Role of Instrumental and Affective Factors in Work and Leisure Journeys by Different Travel Modes," *Transportation Research Part A: Policy and Practice* 39 (2005): 163–181; Barnes and Krizek, "Estimating Bicycling Demand"; P. Cox, "Conflicting Agendas in Selling Cycling" (paper presented at the annual meeting of Velo-city, Dublin, Ireland, 2005; also in *Velo-city 2005 proceedings DVD* [Dublin: Department for Transport/European Cycling Federation, 2006]); De Geus et al., "Psychosocial and Environmental Factors"; Transport for London, *Cycling in London*; Krizek, Handy, and Forsyth, "Explaining Changes in Walking and Bicycling Behavior"; E. Heinen, B. van Wee, and K. Maat, "Workers Mode Choice in the Netherlands: The Decision to Cycle to Work and the Effect of Work-Related Aspects" (paper presented at the 1st annual Transatlantic NECTAR conference, Arlington, VA, 2009); Heinen, van Wee, and Maat, "Commuting by Bicycle"; Heinen, "Attitudes van de fietsforens"; Pelzer, "Bicycling As a Way of Life"; Goetzke and Rave, "Bicycle Use in Germany"; see also V. Van Acker, B. van Wee, and F. Witlox, "When Transport Geography Meets Social Psychology: Toward a Conceptual Model of Travel Behaviour," *Transport Reviews: A Transnational Transdisciplinary Journal* 30, no. 2 (2010): 219–240.

and status of the bicycle would contribute to its increasing use. These researchers focus on the individual motivation for choosing or not choosing the bike as a means of transport.

Two perspectives can be distinguished in such studies. The first assumes that the choice for or against a means of transport is based on a rational-instrumental assessment by individuals of its costs and benefits in the light of their circumstances and available options. The usefulness of the bicycle as a utilitarian means of transportation is central in this perspective. The second perspective considers so-called affective motivations (norms and values, beliefs, perceptions, attitudes, and habits) that are largely shaped by the social environment and the wider culture. This perspective stresses that cycling experiences are molded in various ways and that they cannot be reduced to economic and other utilitarian considerations.²²

Several researchers, however, put the difference between instrumental and affective motivations in perspective. They argue that instrumental choices can be understood only in the context of affective motivations. In daily practice, apparent objective cost and benefit assessments are usually imbued with subjective perceptions of advantages and disadvantages. Such perceptions are embedded in habits, routines, experiences, and attitudes. In a cost and benefit assessment of cycling relative to other modes, factors might include matters of time, physical effort, health effects, convenience, efficiency, safety, and financial costs. The way in which these factors are judged varies considerably between individuals of different bicycling experience. People who seldom or never bicycle would identify far more barriers to cycling than regular cyclists, and would also hold environmental and infrastructural conditions to higher standards.²³

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22. Anable and Gatersleben, "All Work and No Play?"; De Geus et al., "Psychosocial and Environmental Factors"; Heinen, van Wee, and Maat, "Commuting by Bicycle"; Goetzke and Rave, "Bicycle Use in Germany"; see also B. Verplanken et al., "Attitude Versus General Habit: Antecedents of Travel Mode Choice," *Journal of Applied Social Psychology* 2, no. 44 (1994): 285–300; B. Verplanken, H. Aarts, and A. van Knippenberg, "Habit, Information Acquisition, and the Process of Making Travel Mode Choices," *European Journal of Social Psychology* 27, no. 5 (1997): 539–560; S. Bamberg, I. Ajzen, and P. Schmidt, "Choice of Travel Mode in the Theory of Planned Behavior: The Roles of Past Behavior, Habit, and Reasoned Action," *Basic and Applied Social Psychology* 25, no. 3 (2003): 175–187.
23. Noland and Kunreuther, "Short-Run and Long-Run Policies," 75–76; P. Gordon and H. Richardson, "Bicycling in the United States: A Fringe Mode?," *Transportation Quarterly* 52, no. 1 (1998): 9–11; Anable and Gatersleben, "All Work and No Play?"; T. Krag, "Cycling, Environment, Exercise and Health," in *Cost Benefit Analysis of Cycling*, ed. G. Lind (Copenhagen: Tema Nord, Nordic Council, 2005), 64–68; Barnes and Krizek, "Estimating Bicycling Demand"; B. Gatersleben and K. Appleton, "Contemplating Cycling to Work: Attitudes and Perception in Different Stages of Change," *Transportation Research Part A: Policy and Practice* 41, no. 4 (2007): 302–312; B. Gatersleben and D. Uzzell, "Affective Appraisals of the Daily Commute: Comparing Perceptions of Drivers, Cyclists, Walkers, and Users of Public Transport," *Environment and Behavior* 39, no. 5 (2007): 416–431; De Geus et al., "Psychosocial

Individuals' evaluations of the bicycle and their perceptions of its advantages and disadvantages are also influenced by social attitudes and biking habits. A self-fulfilling prophecy can be observed here: a favorable or unfavorable perception of the bicycle will determine whether the advantages or the disadvantages of its use are stressed. These perceptions determine whether people choose the bike as a means of transport and whether they develop cycling experience. In turn, experience again determines perception. The choice to cycle or not to cycle for transport is embedded in an accumulation of reinforcing meanings, perceptions, and experiences, both individual and collective. It is substantially mediated by cultural and historical factors.²⁴

Analysis of bicycle studies and their diverse, uncertain, and ambiguous conclusions reveals some misalignment with the presuppositions of cycle policies. This research implicitly or explicitly questions basic assumptions of such policies, in particular the notion that bicycling is a matter of individual and rational-instrumental choice and the optimistic idea that policy measures based on technical expertise and sensible planning can boost bicycling rates. Analysis of more than two hundred studies supports four conclusions.

First, cycling levels are far from completely determined by geographical, climatological, and environmental conditions or demographic characteristics. The relative influence of these factors and their mutual interactions are still unclear.

Second, the often-assumed causal link between the construction of cycle facilities and the volume of bicycle traffic has not been confirmed. An inverse relation cannot be ruled out: infrastructure policy and its apparent success may be the consequence of a preceding increase in bicycling attributable to other factors and entailing demand for bike provisions. In such a case, bicycle facilities would predominantly serve the needs of those who are already regular cyclists.

Third, where cycling is unusual, bicycle practices are entangled in a vicious circle. The self-reinforcing barriers to cycling are evident in the limited effect of new infrastructure on bicycling levels wherever attitudes and motivations are

and Environmental Factors"; Krizek, Forsyth, and Baum, *Walking and Cycling International Literature Review*, 23–26; Akar and Clifton, "The Influence of Individual Perceptions and Bicycle Infrastructure on the Decision to Bike"; Heinen, van Wee, and Maat, "Commuting by Bicycle"; see also Bergström and Magnusson, "Potential of Transferring Car Trips to Bicycle during Winter"; Stinson and Bhat, "Frequency of Bicycle Commuting," 124–128; Transport for London, *Cycling in London*, 22, 29.

24. A. A. Albert de la Bruhèze and F. C. A. Veraart, *Fietsverkeer in praktijk en beleid in de twintigste eeuw: Overeenkomsten en verschillen in fietsgebruik in Amsterdam, Eindhoven, Enschede, Zuidoost-Limburg, Antwerpen, Manchester, Kopenhagen, Hannover en Basel* (Eindhoven: Stichting Historie der Techniek, 1999); Pooly and Turnbull, "Modal Choice and Modal Change," 15, 23; A.-K. Ebert, "Ein Ding der Nation? Das Fahrrad in Deutschland und den Niederlanden, 1880–1940: Eine vergleichende Konsumgeschichte" (Ph.D. diss., Universität Bielefeld, 2009); Pelzer, "Bicycling As a Way of Life," 14, 99–100; see also Scheiner, "Mobility Biographies."

not already conducive to it. “Soft” policies, such as education, promotion, and marketing, primarily affect people who already cycle and are convinced of its benefits, whereas the target group of such activities—those who never or seldom mount a bicycle—are rarely reached.

Fourth, more researchers have begun appreciating socially and culturally determined attitudes, experiences, and perceptions on bicycling, which are not amenable to rational decision making and social engineering. Their findings dovetail with more general pleas for a cultural turn in transport and mobility studies.²⁵ However, social scientific bicycle research must still reckon with the evolution of these attitudes, experiences, and perceptions in history and in the context of national cultures. Some scholars refer in passing to the influence of history and culture—in particular if their surveys fail to establish correlations between bicycle levels and other factors. In social scientific bicycle research, history and culture appear as residual categories that are almost invisible because they cannot be analyzed by the standard quantitative methods of such research.²⁶

It is striking that policy-oriented researchers have not taken notice of the many historical works on bicycling that have been published in the past three decades—at least I found no such references in their papers.²⁷ Only a few acknowledge the importance of culture and history. With regard to the attempts of policy-oriented bicycle researchers to establish correlations between bicycling policies and infrastructure on the one hand and the volume of bike traffic on the other, the American bicycle scholars Gary Barnes and Kevin Krizek, for example, point out that local variations in levels of bicycling across different areas in

25. See, e.g., C. Divall and G. Reville, “Cultures of Transport: Representation, Practice and Technology,” *Journal of Transport History* 26, no. 1 (2005): 99–111; M. Sheller and J. Urry, “The New Mobilities Paradigm,” *Environment and Planning A* 38 (2006): 207–226; J. Spinney, “Cycling the City: Movement, Meaning and Method,” *Geography Compass* 3, no. 2 (2009): 817–835; P. Vannini, “Mobile Cultures: From the Sociology of Transportation to the Study of Mobilities,” *Sociology Compass* 4, no. 2 (2010): 111–121.

26. See, e.g., the passing reference to “culture, custom and habit” in J. Pucher, J. Dill, and S. Handy, “Infrastructure, Programs, and Politics to Increase Bicycling: An International Review,” *Preventive Medicine* 50 (2010): 106–125, here: 121.

27. On the other hand, neither have historians in the field of bicycle history advanced a rapprochement to social scientific bicycle researchers. To a large extent, the focus of historical work has been on the nineteenth- and early twentieth-century history of the bicycle, and only a few studies have examined its role in twentieth-century mass mobility. For historiographical overviews, see M. Stoffers and H. Oosterhuis, “‘Ons populairste vervoermiddel’: De Nederlandse fietshistoriografie in internationaal perspectief,” *Bijdragen en Mededelingen betreffende de Geschiedenis der Nederlanden/The Low Countries Historical Review* 124, no. 3 (2009): 390–418; M. Stoffers, H. Oosterhuis, and P. Cox, “Bicycle History As Transport History: The Cultural Turn,” in *Mobility in History: Themes in Transport (T²M Yearbook 2011)* (Neuchâtel: Presses Universitaires Suisses, 2010), 265–274; see also Manuel Stoffer’s online bicycle history bibliography at www.fasos-research.nl/sts/cyclinghistory.

the United States cannot be reasonably explained by differences in policies and infrastructure. In their view, unmeasured cultural and historical factors, which are beyond the control of planners and policy makers, may be more significant. They therefore contend that such factors must be included in bicycle research, although they do not indicate how this should be done.²⁸ Together with Susan Handy and Ann Forsyth, Krizek also suggests that the disregard of history is related to bicycle researchers' bias toward practical effects. Their work is, according to Krizek, Handy, and Forsyth, "fraught with practical challenges as well as political ones: expectations are high, interventions are modest, and effects may be unclear ... consumers of research ... have a responsibility to understand the limitations of the available evidence and not misuse that evidence in making the case for bicycle and pedestrian interventions."²⁹

The rational-instrumental approach and the planning optimism of many bicycle scholars and most policy makers disregard the tenacity and persistence of bicycling's cultural and historical dimensions. These dimensions undermine the assumption that policies can bring about substantial changes in mobility behavior. The physical and sociocultural conditions that determine cycling behavior have evolved historically within national contexts. Bicycle policies' success therefore depends to a large degree on historical and cultural factors. Historical and comparative research would strengthen policy-oriented bicycle research.

Research in utilitarian cycling would benefit from a new approach that attends to national historical trajectories and national bicycle habitus. With these analytical tools, researchers could develop an international-comparative perspective that bridges the present gap between historical and policy-oriented research into bicycling.³⁰ National bicycle cultures in Western countries could be established through comparisons of bicycle traffic volumes, meanings and images of the bike, and cyclists' motivations. Researchers should also consider the nature of bicycle policies and bicycle activism, and their results. For example, it is clear that there is a marked contrast between the Netherlands and Denmark on the one hand and the English-speaking countries on the other. Other northwestern and central European countries take up a middle position, while most of the eastern and southern European countries lack cycling policies or activism. The next step would be to attempt to explain these national differences by considering the diverse historical trajectories that have shaped them. Researchers must investigate the vicious circles that entangle natural environment, infrastructure,

28. Barnes and Krizek, "Estimating Bicycling Demand."

29. Krizek, Handy, and Forsyth, "Explaining Changes in Walking and Bicycling Behavior," 725, 737.

30. The concepts of habitus (coined by Pierre Bourdieu) and path dependence have been used fruitfully by Peter Pelzer in his comparative study of bicycle cultures in Amsterdam and Portland; Pelzer, "Bicycling As a Way of Life."

patterns of urbanization, habits and attitudes, meanings and perceptions, and bicycle policies and bicycle activism.

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