Changes in United States' Citizens' Interest in Sustainability (2004 – 2014)[1]

Lori Andrew[2], Daniel Arndt[3, 21], Nick Beristain[4, 21], Tiffany Cass[5, 21], Tiffany Clow[6, 21], Bianca Colmenares[7, 21], Kaitlyn Damm[8, 21], Rachel Hatcher[9, 21], Nick Jackson[10, 21], Whitney Pasquesi[11, 21], Nikki Chamberlain-Pham[12, 21], Julie A. Pryde[13, 21], Thad Rund[14, 21], Gail Russell[15, 21], Caleb Ryle[16, 21], Terry Schmidt[17, 21], Stevie Sigan[18, 21], Kallie Sinkus[8, 21], Keith Sneyd[8, 21], Jared Strode[19, 21], Chip Wallen[20, 21], and Malcolm L. McCallum[21, 22]

Abstract: In the most intensive study to date (338 terms and phrases) using carefully selected internet queries to study public interest, we investigated searches for sustainability. Previous studies demonstrated falling interest in environmental issues, but interest in sustainability was stable from 2004 – 2010. Terms crossed sustainable living, public policy, media sources, green technology, sustainable agriculture, and sustainable communities. Overall, interest in sustainability had meager growth since 2004. Interest in sustainable agriculture and sustainable living grew modestly, but most other areas showed mildly reduced public interest. We recommend that term usage in environmental initiatives emphasize connections to sustainability to possibly improve success. Finally, we raise concern that flat-lined public interest in sustainability is not good news. Our use of an extensive list of sustainability-related terms did not counter previous findings. However, it provided a better understanding of how subareas changed; so we recommend that future studies using internet queries use large lists of terms and phrases.

Key Words: Sustainability, Public Interest, Google Trends, Conservation, Environment, Environmentalism.

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[2] Public Health Program, School of Health Studies, College of Health and Human Sciences, Northern Illinois University, DeKalb, Illinois 60115 USA. E-mails: landr3@uis.edu, zenarcher@comcast.net. The email(s) of the remaining authors (if available) follow(s):
[3] darnd2@uis.edu , Daniel.arndt@duke-energy.com , [4] nberi2@uis.edu , nickberistain@gmail.com , [5] tiffany1989@comcast.net , tread2@uis.edu , [6] tiffany.clow@yahoo.com , tclow2@uis.edu , [7] Bianca.colmenares620@gmail.com , [8] no email available, [9] Rachelhatcher89@gmail.com , [10] jaxn11@hotmail.com , [11] whitpasquesi@gmail.com , [6] nikkimcpham@gmail.com , [13] jpryd2@uis.edu , juliepryde@gmail.com , [14] thadrund@gmail.com , [15] gruss3@uis.edu , [16] cruyl2@uis.edu , [17] tschm4@uis.edu , [18] sesigan@gmail.com , [19] Jaredstrode@gmail.com , and [20] Chip.wallen@mfschools.net .
[21] Environmental Science Program, University of Illinois Springfield, Springfield, Illinois 62703 USA.
[22] Corresponding author's current address: Aquatic Resources Center, Cooperative Research, Extension, and Education, School of Agriculture and Applied Sciences, Langston University, Langston, Oklahoma 73050 USA. E-mail: mlmccallum@langston.edu

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Introduction

In the early 21st century, investigators started reporting declining public interest in the environment. First, evidence came forth that youths had become significantly less environmentally conscious from 1976 – 2005 (Wray-Lake et al. 2010). Then, internet search behavior demonstrated that search queries for environmental subjects had declined since 2004, suggesting lagging interest by the general public (McCallum and Bury 2013). A debate ensued that suggested internet search behavior was not really an indicator of declining interest, and that the absolute population of environmentally interested people may actually be growing (Ficetola 2013). However, much of this argument stemmed from misunderstanding of how Google handles search queries and lack of attention to the relative importance of how policy is driven by proportional popularity of subjects, not simple growth in absolute numbers of those engaged (McCallum and Bury 2014). In fact, Google Trends is more representative of the entire population and less susceptible to investigator bias than any other form of survey available today (see discussions in each of McCallum and Bury 2014, 2015). A series of follow up studies supported the notion that interest in the environment was declining. Two separate reports established that interest in fishing and angling had declined from 2004 – present (Martin et al. 2012, Wilde and Pope 2013), and another demonstrated that interest in the environment largely peaked in the 1960s and then began declining in the 1990s (Richards 2013). Sustainability was one environmental topic that did not show obvious decline in use since 2004 (Figure 1) (McCallum and Bury 2013). Queries declined from 2004 – 2006, and then appeared to rebound. However, the changes were so slight that one could conclude this was noise in the dataset. There were also problems arising from non-environmentally related use of the term.

Sustainability as a concept and term can be traced to the early 12th to 16th centuries (Ehnert 2009, also, see Box 1, page 140). With cultural changes during the 1960s (McKenzie 2004) and the energy crisis of the 1970s (Jacob and Brinerhoff 1999), it became a part of the environmental movement that seemed to regularly surge and subside with the American public throughout the 1980s and 1990s (Eckersley 1992, but see Richards 2013). Some consider environmentalism to be the precursor to modern sustainability (Edwards 2005); whereas, others hint that it reflects a different perspective that reframes crisis ecological arguments as human problems (Mueller 2009), especially as economic concerns (Banerjee 2003). In fact, the United Nations identified at least 100 different definitions for sustainable development (Ricketts 2010), with a key issue being the stronger attention to social ecology and economics (Grandisoli et al. 2011) compared to the historical focus of environmentalism.

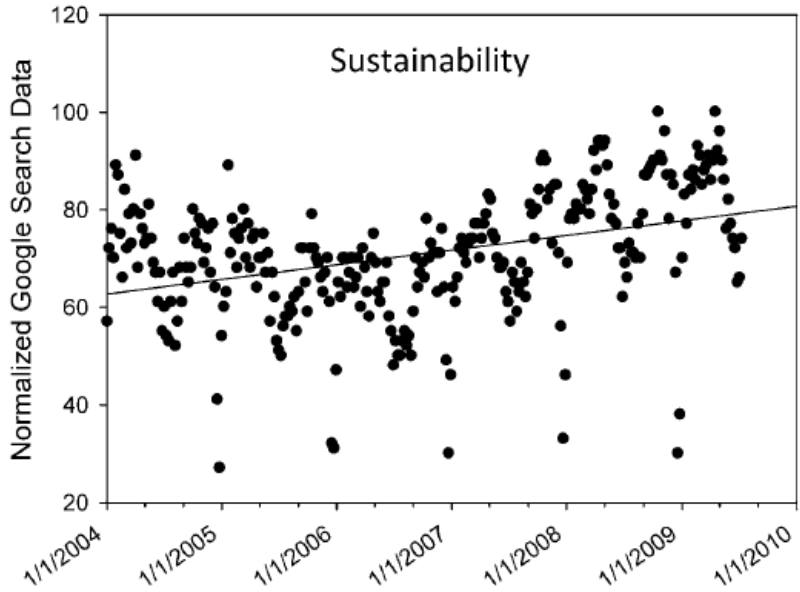

Figure 1. Scaled, normalized search data obtained from Google Trends for the term "Sustainability" (from McCallum and Bury 2013).

Box 1. The Many Definitions of Sustainable Development

Source	**Definition**
United Nations 2012 Brundtland Commission (UN) 1987	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
U.S. Census Bureau	a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with the future as well as present needs
Environment and Climate Change Canada	Sustainable development respects the limited capacity of an ecosystem to absorb the impact of human activities.
Ministry of Environment Climate Change disaster Management and meteorology	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs or the persistence of other species.

By the late 1980s, the Brundtland Commission passed sustainability and sustainable development into policy discourse and everyday language with the first global overview "of the environmental aspects of development from an economic, social and political perspective," thus a major advancement of UNESCO's Man and the Biosphere Program (Redclift 2005). In 2005, UNESCO initiated its "Decade of Education for Sustainable Development" initiative (UNESCO 2014). Its goal is to "contribute to enabling citizens to face the challenges of the present and future" and to help "leaders make relevant decisions for a viable world." These efforts are intended, ultimately, to grow interest in sustainability and foster its adoption around the world. Combined with the reality of climate change and biodiversity declines becoming academic in the mid-2000s, one would expect interest in sustainability to grow because of the clear linkages between the two subjects (Beg et al. 2002, Sathaye et al. 2006). However, the tension between want and greed that is fundamental to sustainability (Yamini 2013) might retard growing interest in this subject.

Understanding how engaged the public is with the broad subject of sustainability should help local, regional, national, and international policy makers create strategies for promoting related initiatives. Therefore, we first 1) ask if public interest in sustainability is static, growing or declining; and 2) assess why there may be more interest in sustainability than the environment. We predict that if interest in the sustainability is increasing, then the average slope of search query data should be positive, if it is declining the slope should be negative, and if there has been no change the data should have a zero slope. Additionally, we ask if using large numbers of subject-related terms in studies using internet queries such as the Google database are more informative than those with a few carefully selected terms.

Methods

Our methodology followed that of McCallum and Bury (2013) with the following clarifications and alterations. First, we assembled a list of carefully selected 338 terms and phrases (herein, collectively referred to as "terms") related to sustainability (Appendices I - III). The list of terms was divided among the 17 investigators. About 20% of the sustainability-related terms were generalized broad topics, ~ 1/3 were subcomponents of sustainability (e.g. sustainable development, sustainable agriculture, etc.), and 47% were specific topics that fall within the subject of sustainability (e.g., LEED certification, green buildings, gardening, etc.). Terms spanned many areas including sustainable and organic agriculture, personal behavior and sustainable living, sustainable communities, and green technology. About 87.4% of the population of the United States used the internet in 2015 (Miniwatts Marketing Group 2016). Search engines are among the most commonly accessed websites online, with millions of people submitting billions of queries each month (Hargittai 2007) and rivals email as the most common activity undertaken by internet users (Rainie and Shermak 2005).

The Google search engine comprises 75.2% of the U.S. search market (Smith 2016), or 65.7% of the U.S. total population. Although we cannot assess the actual demographics of these users, it is clear that the Google database provides admirable coverage of the U.S. population. We queried Google Trends (GT) (http://www.google.com/trends/) for each term with the search parameters restricted to the United States, spanning 2004 – 2013, found in all categories and in all web searches. Upon retrieval of results, if GT returned an insufficient search volume for the term, then we excluded it from the results. If the list of related terms provided in the results from each GT query included topics unrelated to sustainability, we re-ran the query with that /those terms excluded (-"erroneous term"). Upon finalizing the output from the GT query, we downloaded the CSV file for manipulation and analysis. The output from each finalized query was subjected to regression analysis to determine the dispersion, slope, and strength of each distribution. The regression coefficients were plotted against the slope of each term's distribution for further interpretation. Additionally, all of the regressions were plotted together on a single graph and a regression of the entire system of distributions performed providing the average trend in the system (Neter et al. 1996). The data was already normalized and scaled by Google during the query, so it was not necessary to weight the outcomes.

Results

Google Trends identified 2.4% (8/338) of the terms as having insufficient search volume (Appendix I) and anther 10.7% (36/338) of the terms had insufficient data to perform any meaningful analysis because their distribution was limited to only a few weeks or days over the entire time period (Appendix II). The remaining terms (86.4%, 291/338) had GT outputs sufficient for interpreting trends in this study (Appendix III). The comprehensive slope averaged from among all sustainability terms was slightly positive; however, four of the six subcategories of sustainability had negative average mean slopes (Table 1). It appears that the public has grown more interested in topics related to sustainable agriculture and sustainable living, but their interest in green technology, related policy issues, components of sustainable communities, and media sources of information about sustainability (e.g. books, magazines, internet forums) has declined. None of the subcomponent areas of sustainability expressed prominent trends in any direction (Table 1), although some of the individual terms had very strong regression coefficients and/or slopes (Figure 2). However, 28.3% (17/60) of policy related terms had high regression coefficients. Still, only 7% (n = 4) demonstrated noticeable changes in use, hence little if any change in public interest has occurred.

Table 1. Change in search volume and mean regression coefficient for terms and phrases in each subcategory of sustainability. All regression coefficients and slopes are averages except for the overall value.

	N	Mean r^2	SE	Mean Slope	SE
Overall	291	0.1924	0.0125	0.00153	0.00183
Green Technology	43	0.2000	0.0269	-0.00818	0.00441
Green Policy	60	0.2794	0.0344	-0.00147	0.00541
Green Media	14	0.1496	0.0581	-0.00291	0.00403
Sustainable Agriculture	60	0.1764	0.0244	0.01013	0.00446
Sustainable Living	91	0.1703	0.0407	0.00556	0.00230
Sustainable Communities	23	0.1545	0.0207	-0.00763	0.00553

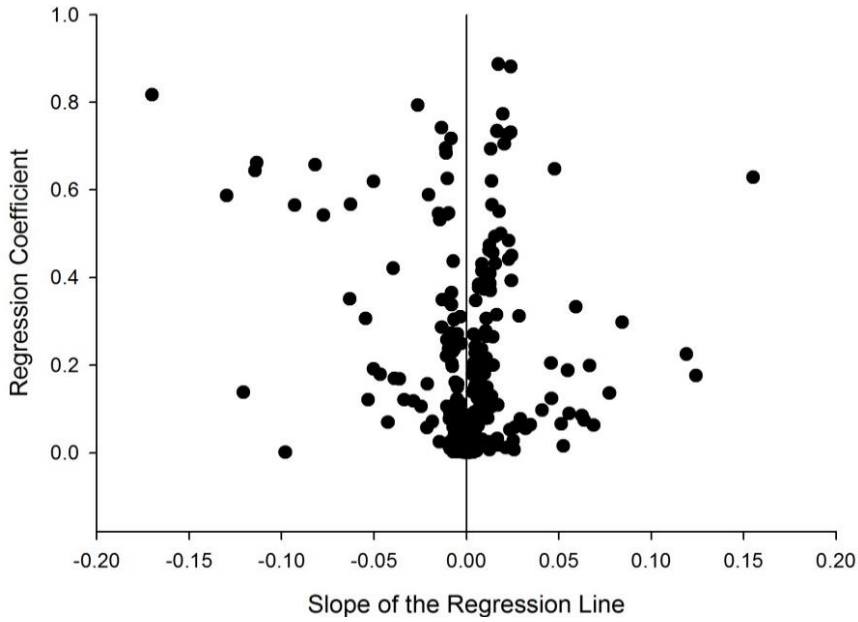

Figure 2. Strength and slope of distributions for each term or phrase related to sustainability that was queried using Google Trends. Most terms demonstrate no appreciable change in public interest from 2004 to 2013.

Discussion

We believe that this study is the most extensive attempt to investigate public interest using Google Trends. Many studies are restricted to as few as 1-2 terms or phrases, and even studies with a dozen or so terms are uncommon (see McCallum and Bury 2013, 2014). This study demonstrates that extremely large sets of terms and phrases can provide a much more thorough understanding of public interest and its role in the use of internet searches, but does not discount the importance of studies using well-thought-out, smaller sets of terms. It has generally been accepted that careful selection of terms is important for these kinds of studies (see discussion in McCallum and Bury 2013, 2014), and our results do not contradict this. However, after querying almost 300 terms we believe that more is better, providing terms are carefully selected and confounding multiple meanings carefully culled from the results. Larger numbers of terms reduce the odds of choosing a term that is simply going in or out of vogue, and it reduces the chances that the investigator might unintentionally incorporate biases rising from his/her feelings, preconceptions or background. The large number of terms also allows one to tease out several subareas of sustainability to infer whether some areas might be declining or growing in the public's eye.

It appears that interest in sustainability and the subareas identified in this study remained relatively stable from 2004 – 2013. But what makes sustainability issues unique compared to more generalized environmental (e.g. ecology, environment, conservation, sustainability, climate change, global warming, pollution) or conservation (e.g. wildlife, fisheries, biodiversity, endangered species, habitat fragmentation, extinction, invasive species, and fish, amphibian, reptile, mammal, invertebrate, and bird conservation) issues for which interest has been falling (McCallum and Bury 2013, 2014)? Despite significant overlap in subject matter, sustainability and environmentalism have distinctly different origins, thus different baggage. Environmental science and conservation rose out of the natural sciences, whereas sustainability was sourced largely from the social sciences (Paehlke 2005, Ehrenfeldt 2005). As such, the focus of subjects modified with the terms conservation or environmental (e.g. conservation agriculture vs. sustainable agriculture) might be perceived as preservationist in nature, with motives that are "despite humans" (Newton and Freyfogle 2005). Sustainability, appears to the average person to more directly benefit humans, is certainly more anthropocentric, and can be viewed "exclusive of biodiversity issues" (Newton and Freyfogle 2005, Paehlke 2005).

The average person has often been exposed to sustainability as a way to save money and use resources wisely (McKenzie-Mohr 2000, Paehlke 2005, Ehrenfeldt 2005, Anonymous 2006); whereas, their perceptions of environment and conservation issues might be as a cost without real personal benefit, especially when regulations and fines are faced by a business setting and/or reported by news media. Behavior is strongly influenced by economic motives, especially self-interest (McKenzie-Mohr 2000) and convenience (Arbuthnott 2009); whereas,

enhancing knowledge and creating supportive attitudes often has little to no observable effect (Geller 1981, Geller et al. 1983, Finger 1994, Bickman 1972). Sustainability's foundations include aspects of financial efficiency that everyone agrees on, and which are interconnected with ecological concerns. Hence, it stimulates environmental progress by providing a path to environmental improvements as well as environmental awareness for those whose core identities involve the rejection of such environmentally critical concepts as evolution or the rejection of the anthropocentric universe (Kahan and Corbin, in press).

A large focus of sustainability is on what individuals can do while tying in economic motives (e.g. local foods, recycling, littering); whereas, environmentalism tends to focus on educating the public about broader, national or global issues that are more easily attended to by the government or organizations and often involve legal requirements (e.g. endangered species, air pollution, climate change). This "what I can do" perception of sustainability must be more inviting than the "what I am allowed to do" spin on environmental issues. Actions individuals can do to live more sustainably add up, and are easily understood and implemented, with obvious results (Anonymous 2010, see also Anonymous 2013). However, this is confounded by the variation in prices involved with some practices labeled as "sustainable." For example, buying at a local farmer's markets can often be thrifty (Ange 2001, Govindasamy et al. 2002, de Figueiredo 2010); but, some farmer's markets are inundated with value-added products that significantly increase prices (Brown 2002, Feenstra et al. 2003, Gillespie et al. 2007). For example, organic products can be significantly more expensive than non-organic (Thompson and Kidwell 1998, Rigby and Caceres 2001, Sahota 2010). Regardless, the consumer's choice to buy local, at Farmer's Markets, or participate in other sustainable behavior is influenced by a multitude of rewards arising from perceived quality (Weaterell et al. 2003, Grunert 2005, Wolf et al. 2005), to socio-psychological factors (Selfa and Quazi 2005, Hunt 2007, Smithers et al. 2008), to other intangible factors that are difficult to assess (Payne 2000, Hinrichs 2000, Guthrie et al. 2006). Few of these factors are easily provided via the conventional food system and non-sustainable activities (Ng 2003, Kirwan 2004, Hughner et al. 2007).

Conversely, the large global environmental problems are much less obvious in of themselves, often spanning generations (McCallum 2015), and individual actions to reduce such threats are often viewed as futile and at least inconvenient (Stern 2000). For example, buying spray cans that do not use chlorofluorocarbons (CFCs) helps reduce ozone layer degradation, but the average person does not understand atmospheric geochemistry, and the individual's contribution made by reducing use of CFCs is largely unrecognizable. Further, when that initiative to lower CFC use was launched, CFC spray cans were much cheaper than the alternatives, which were largely difficult to find in stores anyway. However, the rewards for buying locally or lowering your thermostat are immediately apparent, often directly felt with reduced bill payments, and pretty easy to accomplish. The

economic motives and convenience may be sufficient to explain the relatively unchanged interest in sustainability compared to declining interest in environmentalism.

However, one might assume that sustainability lacks the significant baggage to which environmentalism is tied (Chapman et al. 1997; Stewart and Clark 2011). Consequently, it may have a more robust framework in which to seat environmentally relevant topics (Ezrahi 1990) and may be less susceptible to brownlash or anti-scientific attitudes typically directed at environmental science and policy (Ehrlich and Ehrlich 1996, Guston 2001). The fundamental nature of sustainability vs. environmentalism should require less boundary work against threats to scientific cognitive authority (e.g. fraud, pseudo-science, and misinformation) that alter public perception of the place and importance of environmental issues (Guston 2001). For example, environmental protests and uprisings in the past are remembered as negatives by some political groups (Dunlap et al. 2001; McAllister 1994; Dunlap and Mertig 2013) and were largely driving policy from one side of the argument. Sustainability may be sheltered from this fallout because some aspects are innately accepted by both the environmentalist and the anti-environmentalist (Guston 2001), albeit for different reasons. Further, many media sources regularly attack and ridicule environmentalism and conservation (Stewart and Clark 2011, Schlosberg and Bomberg 2008, Psaros 2006), but seldom mention the term sustainability except positively, especially in the light of reducing expenses through efficiency (personal observation, coauthor McCallum). Recent findings demonstrate that the media are important information sources and that their positive attention to environmental issues stimulates pro-environmental behavior (Östman 2013, Nerlich et al. 2012). Sustainability topics might be better received in general because of the positive press (Östman 2013), and by environmental skeptics than is environmentalism because the predisposed language triggers notions of saving money (McKenzie-Mohr 2000) and benefiting humans instead of costing money and creating barriers to progress (Horrigan et al. 2002, Vries et al. 2013). In fact, focus on compatibility is believed to more effectively promote interdisciplinary collaborations in the context of complex socio-ecological problems (Hirsch and Luzadis 2013). This might help explain why sustainability has not declined like environmental topics. One could speculate that the term "sustainable land management" might be better received than "land conservation" or "environmental land management" even if all three are basically synonymous with largely identical outcomes. Therefore, it might be prudent to consider term-use in new initiatives simply to avoid the pitfalls and minimize barriers to conservation and environmental activities (Uusi-Rauva and Heikkurinen 2013). This logic is supported by both social representations theory and identity process theory from social psychology (Jaspal et al. 2013).

The fact that sustainability has remained a relatively stable part of the public's interest suggests the field is more resistant to the social influences that sometimes

hamper environmental progress. If conservation, environmental and sustainability professionals understand this, it is possible for the phenomenon to be used to the advantage of the environmentalist. Terminology can be tweaked to emphasize connections with sustainability and reduce anti-environmental rhetoric and pressure on areas that require action by either improving or clouding the science-policy boundary as needed (Hirsch and Luzadis 2013) especially within the eye of the "formative public" (Böschen 2013). For example, assume a certain species requires restoration activities of longleaf pine forests. If we request funds be shifted to conservation of longleaf pine savannah, it is likely to get a backlash from certain politicians and political groups. However, requesting funds be the devoted to the sustainability of longleaf forest landscapes might be more successful because the language clouds science-policy boundary, creating an apparent boundary overlapping environmental and anti-environmental philosophies, potentially tempers public perceptions of the cognitive authority, and consequently avoids brownlash,… even though the outcome is exactly the same: Increased funds to restore longleaf pine savannah to assist a wildlife species. This might seem dishonest, but the reality of the political landscape in which conservation, environmental, and sustainability workers reside is that minimizing misinformation campaigns and direct attacks, while enhancing the acceptability of language within policy proposals, may be more important than the actual substance of the proposal in question (Rank 1974). This also might circumvent the separation, reconciling, and reconstructing of environmental behavior as vice by the public (see Yeo 2014). We must strategically frame environmental issues for success, because the anti-environmental campaign is doing it and will readily greenwash any behavior as sustainable or environmentally friendly (Schlichting 2013, Plec and Pettenger 2012, Besel 2012).

UNESCO (2010) had identified challenges and opportunities for different regions and placed education and sustainable development as a high priority in North America. They noted that key actions included strengthening existing regional and sub-regional alliances and networks, encouraging twinning programs, bilateral cooperation and partnerships, and existing international legally binding instruments including the Aarhus Convention. It has inspired some initiatives to foster growth of the global interest in, and understanding of sustainability issues (Wals 2013). Further, higher education institutions are beginning to systemically shift the focus of education, research, operations, and community outreach towards sustainability (Wals 2013) with initiatives such as The Learning City (Van Wynsberghe and Moore 2015), whole community transformation (Mitchell et al. 2015), and refocusing undergraduate study (Contreras 2015). However, all of these efforts are early in their development despite the DESD being half over, and interest in sustainability has remained relatively stable since 2004. A simple query on Google for "high school environmental curricula" returns 63,700,000 hits. However, the same query for

sustainability returns only 18,500,000 hits. Despite the interrelationship between environmental and sustainable activities, a disconnect remains. Thus, activities intended to grow the numbers of people engaged in sustainability do not appear very successful and growing the proportion of the public interested. It is the proportion of the public, not the absolute numbers that drive policy in democracies and republics like the United States (McCallum and Bury 2014). Despite much work, this shows more effort and more effective methods that drive people to lead sustainable lives are needed if the goal of global sustainability is to be met.

We conclude that sustainability has remained a stable part of the public's interest since 2004, despite declines in interest on a myriad of other environmental areas. Previously, there has been a presumed gap (attitude – behavioral intention gap) between a growing public interest in sustainability and lack of growth in sustainable behavior (Arbuthnott 2009, Vermeir and Verbeke 2006, Leiserowitz et al. 2006). Many have tried to explain this gap (Kollmuss and Agyeman 2002, Padel and Foster 2005, Carrington et al. 2010), but shrinking that gap has met little success (Barr 2007). However, our study suggests that interest in sustainability has not grown much, so the presumed environmental/sustainability attitude – behavioral intention gap may not exist because previous investigators may have over-estimated public interest, especially in their relation to personal behaviors. In that case, lacking sustainable behavior might reflect a lackluster interest in sustainability. At least one study (Boustridge and Carrigan 2000) found conflicting results like these and strongly recommended that research on the attitude – behavior gap must carefully avoid false results, but reports involving a minimal or lacking gap are difficult to find. However, many previous studies relied on somewhat flawed surveys that measured attitudes using much broader questions than those used to evaluate behaviors (Kollmuss and Agyeman 2002) or neglect theoretical formulations necessary for understanding attitude –behavior consistency (Petersen and Dutton 1975). In some studies there was temporal displacement between implementation of the attitude vs behavior surveys (Kollmuss and Agyeman 2002), and very little is known about how attitudes and behavior change over time (Leiserowitz et al. 2005). These problems can lead to flawed deductions and inaccurate outcomes (Newhouse 1991). This might support the gap between interest/attitudes and behavior in regard to sustainability was misidentified or even assumed due to over-estimation of the public's interest in the topic.

The stable interest in sustainability should make its advancement easier than the broader subject of the environment, but continued growth in interest is required for the kinds of improvements society needs. Further, environmentalism might consider adopting terminology that emphasizes relationships to sustainability to increase the probability of success. By doing so, it is quite possible that doors might open where they are currently closed to conservation and environmental agendas. Further, for sustainability activities to make real in-roads, it is important to raise the level of the public's interest so that more people

are engaged. So far, the stable level of interest demonstrates a lack of progress in expanding the foothold of sustainability.

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Appendix I. Terms and phrases that Google Trends queries limited to the United States from 2004 - 2014 returned no data due to insufficient search volumes.

Green Manures	Saving Electricity
Circles of Sustainability	Triple Bottom Line Accounting
Ecolabeling	United Nations Millennium Declaration
IPAT Formula	World Cities Summit

Appendix II. Terms and phrases that Google Trends queries confined to the United States from 2004 – 2014 returned results inadequate for meaningful statistical analysis. Terms were chosen based on scouring related literature and word lists related to sustainability.

Biological pest control	Raising a pig
Organic aquaculture	Green paradox
Organic dairy farming	Home flock
Sustainable agriculture coalition	Homesteading books
Sustainable agriculture initiative	Marginal abatement cost
Sustainable agriculture practices	Pigovian tax
Sustainable agriculture program	Planetary boundary
Sustainable food security	Pollution haven
Sustainable urban agriculture	Rainwater tank
Biocapacity	Resource productivity
Conservation commons	Steady state economy
Dematerialization	Sustainability standards
Earth block house	Tomato transplants
Ecodesign	United Nations Agenda 21
Environmental pricing	Drying meat
Ethical consumerism	Electric hybrid cars
Five capitals	Home biodiesel
Gardening forums	

Appendix III. Terms queried on Google Trends while restricted to the United States from 2004 – 2014. The cell marked with a question mark, "?", in the row labeled "composting toilet" indicates a value that the statistical program MiniTab 13.0 reported as unavailable.

Term or Phrase	r^2	**P**	**slope**
acres magazine	0.007	0.437	0.003
agenda 21	0.266	0.0001	0.005523
agroecology	0.205	0.0001	0.04581
alternative agriculture	0.203	0.0001	-0.00771
alternative energy	0.197	0.0001	-0.00758
alternative fuels	0.338	0.001	-0.00807
apple picking	0	0.674	-0.00038
aquaponics	0.735	0.0001	0.016511
back home magazine	0.106	0.002	-0.0105
back to the land	0.484	0.001	0.0229
backwoods home magazine	0.793	0.001	-0.0264
biodegradable	0.097	0.005	0.040903
biodynamic farming	0.188	0.0001	0.054832
biofuel	0.05	0.0001	0.003422
blue bag	0.62	0.0001	0.013705
boer goats	0.049	0.0001	-0.00314
canning	0.051	0.0001	0.004751
canning fruit	0.002	0.701	-0.00528
canning meat	0.124	0.002	0.046073
canning vegetables	0.004	0.512	0.00541
carbon credit	0.546	0.0001	-0.01503
carbon footprint	0.052	0.0001	0.003092
carbon neutral	0.247	0.0001	-0.00849
carbon trading	0.589	0.0001	-0.02038
carefree city	0.191	0.001	-0.05025
carpool	0.003	0.175	0.000419
certified organic	0.151	0.0001	0.004643
cheesemaking	0.092	0.0001	-0.00897
Chevy Volt	0.347	0.001	0.005075

chick hatchery	0.064	0.017	0.034695
chicken coop	0.566	0.0001	0.013817
chicken plucker	0.312	0.0001	0.02853
climate deniers	0.629	0.0001	0.155191
climate skeptics	0.009	0.412	-0.00876
community garden	0.143	0.0001	0.005075
community gardens	0.064	0.0001	0.004377
community supported agriculture	0.007	0.055	-0.00145
community sustainable agriculture	0.002	0.665	-0.00706
companion planting	0.216	0.0001	0.010755
compost	0.031	0.0001	0.002209
compost tea	0.409	0.0001	0.012703
composting	0.012	0.013	-0.00134
composting toilet	0.031	?	0.008347
composting toilets	0.031	0.0001	0.003835
conserve	0.147	0.0001	0.005948
countryside magazine	0	0.00021	0.000898
cradle to cradle design	0.066	0.048	0.051403
crop rotation	0.194	0.001	0.009912
deep ecology	0.619	0.0001	-0.05016
dehydrating food	0.199	0.512	0.066654
depopulation	0.135	0.0001	0.009895
desertification	0.001	0.467	0.000555
do it yourself solar	0.008	0.305	0.0019
E85	0.024	0.0001	-0.0016
earth charter	0.071	0.002	-0.01847
eat local	0.726	0.0001	0.021969
eco friendly	0.237	0.0001	-0.00958
eco friendly bag	0.542	0.0001	-0.07733
eco friendly clothing	0.04	0.001	-0.00646
eco friendly gifts	0.169	0.0001	-0.03895
eco friendly homes	0.306	0.001	-0.05459
ecofriendly	0.237	0.0001	-0.00958
ecological footprint	0.02	0.001	-0.00258

ecological services	0.105	0.0001	0.013399
ecosystem services	0.105	0.0001	0.013399
ecovillage	0.058	0.0001	-0.00715
electric cars	0.005	0.125	0.000786
emissions trading	0.351	0.0001	-0.06306
energy efficiency	0.02	0.0001	0.0022
energy star	0.349	0.0001	-0.01306
environmental enterprise	0.017	0.231	0.017285
environmental finance	0.055	0.03	0.032057
Environmental Management	0.695	0.0001	-0.01119
environmental metering	0.07	0.0001	-0.00305
environmental performance index	0.007	0.084	-0.00043
environmental quality	0.717	0.0001	-0.00824
environmental security	0.128	0.0001	0.009895
environmentalism	0.254	0.0001	-0.00701
environmentally friendly	0.123	0.0001	-0.00516
fairtrade	0.001	0.543	0.000852
family cow	0.266	0.0001	0.01084
farmers market	0.457	0.0001	0.014258
farmers markets	0.082	0.0001	0.00623
feed-in tariff	0.817	0.0001	-0.17012
food COOP	0.139	0.0001	0.003263
food cooperative	0.306	0.0001	0.0108
food dehydrator	0.237	0.0001	0.008085
food miles	0.705	0.0001	0.0205
food preservation	0.374	0.0001	0.009402
food race	0.125	0.0001	0.006014
free range	0.227	0.0001	0.004762
freezing fruit	0.028	0.123	0.025362
freezing vegetables	0.005	0.449	-0.00681
fruit trees	0.03	0.0001	0.002502
fuel cell	0.547	0.0001	-0.00964
garden seeds	0.001	0.541	0.000438
gardening	0.273	0.0001	-0.00798

gardening books	0.106	0.0001	0.009053
gardening magazines	0.168	0.0001	-0.03622
geothermal	0.066	0.0001	-0.0035
going green	0.004	0.191	0.000869
grass fed	0.881	0.0001	0.024153
gray water systems	0.565	0.0001	-0.09281
green accounting	0.109	0.0001	0.017021
green building	0.258	0.0001	-0.01043
green buildings	0.001	0.098	-0.098
green business	0.286	0.0001	-0.01331
green economy	0.221	0.0001	-0.01063
green energy	0.474	0.0001	0.01254
green homes	0.06	0.0001	0.005395
green jobs	0.229	0.0001	0.006402
green living	0.194	0.0001	0.005373
green manure	0.333	0.0001	0.059197
green mba	0.567	0.0001	-0.06264
Green Peace	0.626	0.0001	-0.01022
green politics	0.018	0.135	-0.00887
green roof	0.179	0.0001	-0.0467
green space	0.137	0.0001	0.004357
green technology	0.216	0.0001	0.01
green trading	0.004	0.202	0.001339
green transportation	0.662	0.0001	-0.11339
grit magazine	0.079	0.0001	0.01154
grow your own	0.278	0.0001	0.010497
growing vegetables	0.125	0.0001	0.007635
hair sheep	0.393	0.0001	0.024374
hatching eggs	0.058	0.0001	0.003801
heritage breeds	0.007	0.434	0.012421
hobby farm	0.062	0.0001	0.006395
hobby farms magazine	0.07	0.494	-0.0024
home dairy	0.315	0.0001	0.01636
home grown	0.036	0.0001	0.001796

home livestock	0.057	0.036	-0.02128
home made	0.114	0.0001	-0.00358
home vegetable garden	0.007	0.167	0.0259
homesteading	0.106	0.0001	-0.0245
horticultural oil	0.001	0.678	-0.00176
how to butcher a chicken	0.002	0.738	-0.00588
human development index	0.001	0.47	0.000242
human population growth	0.386	0.0001	0.012865
hybrid cars	0.304	0.0001	-0.0066
hybrid vehicle	0.388	0.0001	0.010284
hydrogen technologies	0.157	0.0001	-0.02113
IFOAM	0.001	0.835	0.00366
incinolet	0.025	0.092	-0.01463
industrial agriculture	0.129	0.001	0.01355
industrial ecology	0.657	0.0001	-0.08188
insecticidal soap	0.179	0.0001	0.009274
integrated pest management	0.421	0.0001	-0.03965
intercropping	0.085	0.017	0.062558
IPM	0.271	0.0001	-0.00493
LEED	0.022	0.001	0.002157
LEED certification	0.059	0.001	-0.00346
Leopold Center	0.37	0.0001	0.012983
light rail	0.27	0.0001	0.00397
limits to growth	0	0.876	0.001175
littering	0.0001	0.987	1.01E-05
local farms	0.069	0.0001	0.005105
local food	0.693	0.0001	0.013181
local harvest	0.006	0.145	0.001533
locavore	0.001	0.573	0.000669
low carbon	0.14	0.0001	0.008306
making cheese	0.022	0.0001	-0.00141
meat goats	0.033	0.0001	0.004566
milking a goat	0.225	0.0001	0.119116
most fuel efficient vehicles	0.121	0.001	-0.03366

Mother Earth News	0.15	0.0001	-0.00486
mulch	0.021	0.001	0.002766
mulching	0.004	0.139	-0.00148
National Organic Program	0.024	0.093	0.015193
National Sustainable Agriculture	0.074	0.044	0.06376
natural capital	0.181	0.0001	0.009885
natural food	0.0001	0.842	-4.4E-05
NEEM	0.179	0.0001	0.003274
net metering	0.07	0.0001	-0.00305
new urbanism	0.532	0.0001	-0.01437
Nissan Leaf	0.431	0.0001	0.008404
off the grid	0.773	0.0001	0.01981
organic agriculture	0.027	0.0001	0.002105
organic beef	0.005	0.101	-0.00054
organic certification	0.001	0.643	0.00053
organic cheese	0.432	0.0001	0.01575
organic chicken	0.494	0.0001	0.015524
organic dairy	0.038	0.001	-0.0042
organic eating	0.265	0.0001	0.014348
organic farming	0.365	0.0001	-0.00806
organic flour	0.077	0.0001	0.008276
organic food	0.009	0.029	-0.00073
organic foods	0.053	0.001	-0.00248
organic fruit	0.076	0.0001	0.005137
Organic Gardening	0.271	0.0001	-0.00857
organic gardening magazine	0.013	0.205	-0.00905
organic grain	0.009	0.087	0.003454
organic juice	0.462	0.0001	0.012175
organic milk	0.415	0.0001	0.008467
organic pork	0.077	0.007	0.029216
organic poultry	0.025	0.084	0.012492
organic produce	0.002	0.288	-0.00058
organic sustainable agriculture	0.121	0.003	-0.05319
organic vegetables	0.09	0.0001	0.006474

overpopulation	0.231	0.0001	-0.0073
Park and Ride	0.083	0.0001	0.002735
passive solar	0.253	0.0001	-0.00802
permaculture	0.137	0.0001	0.004992
pick your own	0.005	0.109	0.001553
public ecology	0.058	0.018	0.026258
Pyrethrum	0.192	0.0001	0.005165
rain garden	0.165	0.0001	0.007632
rainwater harvesting	0	0.912	0.000146
raise your own	0.006	0.488	-0.00562
recycling	0.191	0.0001	0.003787
reduce waste	0.078	0.0001	0.010324
renewable energy	0.002	0.313	-0.00067
Resilience	0.733	0.0001	0.016702
resource depletion	0.052	0.021	0.023676
RFDTV	0.059	0.0001	-0.00378
Rodale Institute	0.118	0.002	-0.02872
rooftop gardens	0.018	0.039	0.007838
Rotenone -fish	0.029	0.001	0.002886
rototiller	0.031	0.0001	0.003389
save gas	0.075	0.0001	0.003048
save the planet	0.001	0.546	0.00025
saving water	0.173	0.0001	0.007484
seed catalog	0.003	0.178	-0.00078
seed catalogs	0.003	0.178	-0.00078
self reliance	0.077	0.0001	0.004762
self sufficiency	0.002	0.62	-0.00344
self-sufficient	0	0.958	0.000152
Sheep	0.249	0.0001	-0.00292
sheet mulching	0.176	0.005	0.12424
shelterbelt	0.012	0.367	0.021233
Silent Spring	0.001	0.373	-0.00056
Simple Living	0.437	0.0001	-0.00705
Small Farm	0.018	0.002	0.001434

Smart Growth	0.742	0.0001	-0.01343
solar panels	0.155	0.001	0.0051
solar shingle	0	0.635	0.000139
Solar Shingles	0.008	0.044	0.000707
solar water heater	0.003	0.195	0.00096
Spinosad	0.5	0.0001	0.018666
starting seeds	0.063	0.0001	0.0688
storing vegetables	0.033	0.091	0.016651
survivalism	0.089	0.0001	-0.00153
sustainability	0.373	0.0001	0.010452
sustainable	0.157	0.0001	-0.00466
sustainable agriculture definition	0.138	0.62	-0.12068
sustainable agriculture education	0.298	0.0001	0.084282
sustainable aquaculture	0.015	0.44	0.052473
sustainable architechture	0.021	0.003	-0.00369
sustainable communities	0.092	0.0001	-0.00522
sustainable design	0.31	0.0001	-0.00333
Sustainable Development	0.544	0.0001	-0.01058
Sustainable Energy	0.056	0.0001	0.004341
sustainable farming	0.131	0.0001	0.011076
sustainable food	0.551	0.0001	0.017628
sustainable food systems	0.07	0.066	-0.04246
sustainable infrastructure	0.587	0.0001	-0.12973
sustainable living	0.021	0.001	0.002669
sustainable practice	0.136	0.005	0.077409
sustainable seafood	0.2	0.0001	0.014473
sustainable tourism	0.024	0.082	-0.00926
sustainable yield	0.09	0.008	0.055577
Tesla Model	0.384	0.0001	0.006785
tesla model s	0.377	0.0001	0.00667
tesla motors	0.206	0.0001	0.00426
Tesla Roadster	0.212	0.0001	0.00638
the human farm	0.45	0.106	0.024414
The Nature Conservancy	0.684	0.0001	-0.01104

time banking	0.022	0.005	0.002737
tiny houses	0.243	0.0001	0.00493
tragedy of the commons	0.092	0.0001	0.004173
transition towns	0.644	0.0001	-0.11438
tripple bottom line	0.003	0.338	-0.00144
upcycling	0.648	0.0001	0.047794
upick	0.102	0.0001	0.006848
urban farming	0.15	0.0001	0.011228
urban oasis	0.046	0.0001	0.003727
urban sprawl	0.112	0.0001	-0.00588
Vegetable Seeds	0.02	0.001	0.002375
vertical farming	0.077	0.0001	-0.00911
victory garden	0.109	0.0001	-0.00477
walkability	0.161	0.0001	-0.00605
What is Sustainability	0.731	0.0001	0.023996
what is sustainable	0.442	0.0001	0.022822
wind generator	0.115	0.0001	-0.00496
wind power	0.237	0.0001	-0.00653
wind turbine	0.092	0.0001	0.004392
windmill	0.041	0.0001	-0.0014
wood heat	0.001	0.478	0.00048
xeriscaping	0.078	0.0001	0.005092
You Pick	0.887	0.0001	0.017317
zero population growth	0	0.976	0.00025