Using mixed methods research in environmental economics: the case of conservation easements

Catherine M.H. Keske, Dana L.K. Hoag, Donald M. McLeod, Christopher T. Bastian and Michael G. Lacy

Department of Soil and Crop Sciences, Colorado State University, United States of America
E-mail: Catherine.Keske@colostate.edu

Department of Agricultural and Resource Economics, Colorado State University, United States of America
E-mail: Dana.Hoag@colostate.edu

Department of Agricultural and Applied Economics, University of Wyoming, United States of America
E-mail: DMcLeod@uwyo.edu
E-mail: Bastian@uwyo.edu

Department of Sociology, Colorado State University, United States of America
E-mail: Michael.Lacy@colostate.edu

Abstract: Economic research typically uses qualitative methods to identify variables for a pre-specified economic model and to refine language for a survey instrument. This paper illustrates how a group of research economists incorporated ethnographic principles from the field of sociology to create a mixed methods research model for conservation easement preferences and rural agricultural land use. Utilising ethnographic data coding techniques provided more than survey language – the quantitative economic model was also adapted to include a factor analysis of a community"s „sense of place". The project was expanded following the qualitative data collection to include an entirely new source of literature in place attachment. Study findings suggest that ethnographic data recording may be particularly useful to environmental economists, when priors are otherwise unavailable. The paper consolidates four tools from the ethnographic literature (logging, memo-ing, data coding, and theme finding) that can be used in economics research, and which may be particularly effective for the study of environmental values.

Keywords: conservation easements, ethnographic interviewing, mixed methods, sense of place, non-market goods.

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Introduction

While mixed methods research has been used in environmental economics, the qualitative techniques have typically been limited to focus group research for the purpose of designing a quantitative survey instrument (Kaplowitz, Lupi & Hoehn 2004; Martin 2006; Salant & Dillman 1994). This paper draws upon the mixed methods literature to illustrate how theoretical triangulation (the use of more than one theoretical or disciplinary perspective for data interpretation) can be effectively utilised in

environmental economics. Specifically, the qualitative data collection process improved the quantitative economic model of conservation easement choice in the western United States. Four ethnographic tools are formalised and adapted („logging", „memo-ing", „data coding" and „theme finding") for economic research to design two surveys and an economic model aimed at eliciting conservation easement preferences. Use of these ethnographic tools yielded qualitative data that led to an expanded literature review and modified quantitative survey instrument and resulting economic model. As a result, human dimensions and sociology literature on „place attachment" were incorporated into our quantitative analyses utilising random parameters logit (Louviere, Hensher & Swait 2000) and factor analysis techniques (Brehm, Eisenhauer & Krannich 2004; Brehm 2007). Conclusions were that use of ethnographically-based interviewing techniques may be particularly beneficial for environmental economists, who may model "non-market"[2] goods, where priors may not otherwise be available.

Literature review

While the importance of utilising qualitative research techniques in economics is well-documented, the specific qualitative research process that should be used is less clear. There is a vast literature on qualitative research techniques – Creswell (2003, p.2) notes that 19 complete qualitative procedures have been outlined in the sociological literature alone –which form a continuum of qualitative research strategies. This continuum ranges from unstructured ethnographic data collection techniques where the researcher is a passive observer who listens to the language of the natives (Spradley 1979, p. 4), to a highly structured interview or case study methods where the interviewer controls the delivery of the questions with almost rigid precision (Yin 2003).

The cornucopia of qualitative research approaches speaks to a larger issue, in that research need not be boxed into a single paradigm. In his seminal publication, *The Research Act in Sociology*, Denzin (1970) advocates the use of triangulation, the integration of multiple methods to study a research problem. Lewis-Beck, Bryman and Futing Liao (2004) also emphasise that using multiple research methods presents a good validity check for research methodology and findings. More recently, mixed methods research has been proposed as a broader process for scientific inquiry that integrates and synthesises both qualitative and quantitative processes, either simultaneously or sequentially (Newman et al. 2003). There is some debate in nomenclature „mixed methods", but most authors have reached consensus that mixed methods research implies a degree of synthesis. Recent authors have described mixed methods as a third major research approach, in addition to qualitative and quantitative approaches, since each respective approach may prove to be appropriate for different research settings (Johnson, Onwuegbuzie & Turner 2007).

The downside of mixed methods research is that the division between quantitative and qualitative research may become unclear as the approaches become increasingly integrated. Hence the integrity of the methodologies may become unclear or compromised (Schwandt 2006). However, Tashakkori and Teddlie, editors of pivotal mixed methods research texts (1998, 2003, 2010), summarise a prevailing thought in the field: combining both qualitative and quantitative approaches in social sciences seems to many researchers to be a natural or intuitive process (2010).

Compared to other sciences such as psychology, sociology or health science, and education, the discipline of economics embraces a relatively narrow combination of mixed methods research. To frame this in the context of Denzin's work, many economists conduct a narrow version of methodological triangulation by using focus groups for the purpose of developing a survey to collect quantitative data. However, the discipline of economics has traditionally been less receptive to theoretical triangulation, or integrating more than one theoretical approach to interpret data.

[2] „Non-market valuation" is defined as the process of assigning a value to an environmental good whose price is not otherwise appropriately reflected in the market or from market transactions (Loomis 2002).

For example, many economists specifically use focus group interview techniques to address survey instrument construction and design. Numerous authors have noted that qualitative research can be beneficial to economic surveying techniques by reducing omission errors and by identifying language that enhances the validity of the survey instrument (Carson & Mitchell 1993; Kaplowitz, Lupi & Hoehn 2004; Duke & Aull-Hyde 2002; Kontogianni et al. 2001; Boyle 2003; Holmes & Adamowicz 2003; Loomis 2002). The value of qualitative research is also noted in the National Oceanic and Atmospheric Administration‟s (NOAA) Contingent Valuation Panel (1996) guidelines for non-market valuation. However, the NOAA authors offer no specific guidance in how to use qualitative methods. Specific guidelines for qualitative research, focus groups and pre-tests for stated preference surveys are notably absent in non-market valuation texts, such as *A Primer on Nonmarket Valuation* by Champ, Boyle & Brown (2003); and *Valuing Environmental and Natural Resources* by Haab & McConnell (2003).

There are mixed methods reference texts and seminal articles that provide guidance for using qualitative research to conduct survey work; however, these texts are confined and do not specifically address the use of mixed methods research as a whole or the use of qualitative methods in the economic modelling process. For example, an in-depth presentation of survey methodology is presented in Presser et al. (2004). Boyle et al. (1995, p. 252) advocate using a qualitative research procedure to validate a contingent valuation survey design in a river rafting study. Schaeffer and Maynard (2007) suggest guidelines for qualitative research in the social sciences, without specifically addressing ethnographic techniques or economic modelling.

A few noteworthy studies address qualitative research methods in environmental and natural resource economics beyond the use of survey work, without directly making a connection to mixed methods research. In a 2001 study, Kaplowitz and Hoehn demonstrate that both focus groups and individual interviews yield valuable – but different – information for natural resource and environmental economic research. For example, they find that different themes related to employment and ecosystem services came from focus group interviews as opposed to individual interviews. Their findings indicate that the specific qualitative process does, indeed, matter and that different qualitative research approaches may yield results, suggesting that there is a need for formalised guidelines. Xenarios and Tziritis (2007) incorporate focus groups and content analysis into the use of a Multi Criteria Decision Aid (MCDA) process to improve the social learning in the decision-making process of managing aquatic systems. The authors present a compelling argument and a detailed description of how focus groups enhanced their model, including how the criteria and weights are used in the MCDA process, but they do not provide guidance on how to specifically obtain the qualitative data. A study by Kaplowitz, Lupi and Hoehn (2004) uses iterative „cognitive interviews‟ to develop a stated choice questionnaire in an economic valuation study of wetlands. While the authors effectively show how qualitative research can minimise the bias and improve economic valuation studies, they do not formalise a qualitative research process for economic non-market valuation research or modelling. A 1995 study by Johnston et al. (p. 59) notes that the lack of focus group guidelines leads many economists to forego qualitative rearch altogether when developing stated preference surveys. Johnston et al. (1995) conclude that the relatively „unstructured‟ ethnographic approach may assist economists in survey development, but they do not provide specifics about how to record data, or how their models evolved as a result of implementing ethnographic tools. Also missing from the Johnston et al. study is the connection to mixed methods research, as a paradigm.

Although „unstructured‟ ethnographic techniques are commonly used in social sciences such as psychology, anthropology and sociology, the field of economics is primarily a quantitative discipline and does not easily lend itself to pure observation. As an example, pure ethnographic research would have required that the research team simply observe conservation easement market transactions as they take place. This would likely not have been possible as easements are privately transacted, and it likely would not have resulted in the type of quantitative analysis normally undertaken in economics. This study, however, implements ethnographic data encoding techniques from structured focus group interviews that effectively utilised the subjects‟ verbal and non-verbal cues to develop the quantitative data collection instrument and resulting quantitative models. Techniques were drawn primarily from

recommendations in Spradley (1979), Miles and Huberman (1994), Denzin and Lincoln (2000), Bryman (2001) and Lofland et al. (2006). The subsequent quantitative economic analysis of the conservation easement market was modified to variables that summarised what conservation organisations stated that they are trying to protect: a sense of place.

Methodology

By using mixed methods research and integrating ethnographic techniques, this paper presents a unique contribution to the literature by conducting theoretical triangulation of sociology, economics, and ethnography to approach an environmental economics problem. This paper focuses on how ethnographic techniques from the above-stated references improved both the qualitative and quantitative analyses of the conservation easement market. Furthermore, this paper provides economists with guidance on the steps that may be used to integrate mixed methods research into economic modelling. This is exemplified with an example from natural resource and environmental economics: conservation easements.

A conservation easement is essentially a transaction that extinguishes development rights (Keske 2008, p. 12). The land remains in private ownership, but the landowner enters into a binding legal agreement with a public or non-profit agency (usually a land trust) to permanently restrict development on the land. During the past decade, conservation easements have gained momentum as the most commonly used techniques land protection techniques of the United States (Keske 2008, p. 16). The inclination towards using an ethnographically-based qualitative research approach stemmed from the fact that the conservation easement market is still relatively new and unstable, as indicated by inconsistent price information and other characteristics of an emerging market (Nickerson & Lynch 2001; Geoghegan, Lynch & Bucholtz 2003; Anderson & Weinhold 2008). Moreover, most conservation easement transactions are privately negotiated, and thus, transactions data for quantitative analyses are difficult to obtain. The relative lack of transactions data and existing research regarding this emerging market indicated that much could be gained from listening about priorities from potential market participants.

In the first phase of the study, focus groups were conducted to examine potential factors affecting conservation easement markets. The demand side of the market consisted of land trusts and conservation organisations. The supply side was comprised of landowners. Landowner focus groups followed the land trust focus groups nearly a year later. For the sake of efficiency, the research data presented in this paper stems from focus groups with land trusts, as data from these sessions affected the process for the landowner focus groups and later the quantitative survey instruments. Demand-side data for the qualitative phase were collected at the annual North American Conference for conservation professionals. The large number of attendees (about 1,600) and wide range of professional backgrounds allowed for researchers to stratify the research subjects into groups with similar backgrounds, as recommended by Fern (2001, p.8). Eight separate group interviews were conducted with five different sets of land conservation professionals: land preservation specialists, land preservation attorneys, appraisers, trust executive directors and landowners. A diverse composition of groups was secured to derive different perspectives on the conservation values that trusts are seeking when acquiring a tract of land for preservation. There were 59 participants across the eight sessions. This was controlled to be consistent with Fern‟s guidelines that recommend a preferred average of between five and eight participants in a focus group session. All eight demand-side sessions were facilitated by the same person, who had a background in applied economics. Three other researchers conducted note taking throughout the sessions. For the sake of consistency, ethnographic data coding techniques were then conducted by the group facilitator.

Results: ethnographic interviewing and data coding tools

As is typical of most economic research, the original intent of the focus group interviews was to obtain language to refine the intended landowner and land trust surveys regarding easement preferences to be

conducted in the intermountain west of the United States. Prior to conducting the research focus groups, the intended quantitative research phase was development and analysis of a stated choice preference survey. Typical analyses of stated choice data utilise logit techniques such as random parameters or nested logit. These economic models are often based on underlying demand or supply theory related to the object of study. For example, a land trust model from a stated choice survey, based on demand theory, would normally be expected to have easement price, easement attributes, and land trust demographics such as budget for independent variables explaining easement choice.

However, further research into mixed methods research and qualitative methodology led to the use of ethnographic data collection tools, including the theme finding process. As a result, the quantitative survey instrument and the expected quantitative model was modified to include a factor analysis process. Specifically, results from the qualitative research phase expanded the survey to include „sense of place" questions in the survey and a resulting „sense of place" variable in the random parameters logit model of easement choice. Moreover, a related factor analysis utilised several „place attachment" dimensions from survey questions as they related to easement choice. Four techniques from the ethnographic literature that were useful in in the study are summarised below.

Data input procedures: data logging and memo-ing

It is well established that non-verbal cues, such as eyebrow-raising or avoidance of eye contact, contribute to the qualitative data (Spradley 1979; Lofland et al. 2006). However, economists without a systematic means to input these details may miss nuances and rich qualitative information. „Logging" and „memo-ing" are formalised sub-steps of the qualitative data collection, or data input process (Spradley 1979; Miles & Huberman 1994; Denzin & Lincoln 2000; Bryman 2001; Lofland et al. 2006).

Data Logging: A data log reflects what most economists likely consider to be the „traditional" (if not the only) layer of qualitative research. At the basic level, logs consist of a transcription or a summary of video-recorded observations. Less obviously, a log may also be a „systematic" record of environmental and non-verbal cues observed by the researcher during the study.

Memo-ing: Memo-ing is a related part of the data input process. In contrast to purely recording subject behaviours, the researcher jots notes, observations or „puzzlements" that result during the data log process. In this sense, memo-ing is driven by the thoughts of the researcher. When performed during data collection, memo-ing can help the researcher dynamically adapt the guided interview process.

Transcription 1 illustrates how memo-ing guided the research team away from bias during the land trust focus group, and enabled the team to be more open to new variables, such as „sense of place". This metamorphasis is illustrated in subsequent transcriptions. At the beginning of the study group interview process, the research team is still focused more on finding the right language than theme building. Active memo-ing, which reflects the facilitator"s thoughts, allowed the researchers to adapt the interview to an open format for the remainder of the group interviews. The recorded memos were first hand-written by the facilitator, in a rather sloppy, highly abbreviated fashion. Immediately after the session, the researchers collectively compiled several of their memos to note trends for the next focus group. During the transcription process, the memos were typed and combined with the data log, which is shown in Transcription 1. For the sake of providing clarity to the reader, the memos were made into complete sentences.

It is also worth noting that the logs within this transcription document that the rapport between researcher and subject continues although there is a slight misunderstanding about the meaning of „open space". This particular subject provides a very insightful comment that is supported by the other participants, despite the fact that no other participants speaks during this dialogue. As noted at the end of the transcript, the applause and the laughter indicate support from the participants, and a

reconnection between the researchers and the subjects. This exemplifies the rich nature of the qualitative data, and it proved to be useful later in the development of the quantitative analysis.

Transcription 1:

CK (researcher): Imagine a world without limitations. Without having to worry about the IRS requirements, budgets or problems of practice. What is it ideally that you and your trust seek to preserve or conserve? So on your sheet of paper, please take a moment to list up to three of your most important goals. Once you‟ve listed those three goals, if you can, write a sentence that describes the perfect parcel as seen by you and your trust that meets the needs of a conservation easement.

KR (participant)**:** Quality of life, habitat protection, and we are moving away from open space and replacing it with natural areas. So, just to elaborate while you are writing, the idea being open space, but the words we are using more and more is the term natural areas.

DH (researcher): So open space really is a goal then, is that true? But you are really using the words „natural areas‟?

KR: Right, right.

DH: One of the things that we hope to get at is the difference between what you say and what you mean. OK? Because those are becoming more and more important every day.

KR: Right.

DH: So I‟m going to write open space because that‟s what you really meant?

KR: Well, it‟s not just any open space, but it is open space.
Memo: Seems frustrated because she is unable to communicate the difference. What lies at the heart of what she is saying?

CK: Applied open space? Would that be appropriate? Applied?

CB (researcher): Just why don‟t you write down what she said? Natural areas.

DH: Is that what you want me to write? Natural areas? OK?
Log: KR nods head.
Memo: Disconnect. Pursue this more in analysis. Are we dwelling too much on language? Is specification right?

CK: So what, KR, for you defines, you know, the perfect parcel of land according to the (organisation with which she is affiliated)?

KS: One that connects existing space worthy of protection or already protected that would be easy to steward.
Log: Laughter w/ CK and a hearty round of applause from room.
Memo: Idea reinforced! Reconnected with the participant.

As reflected in the transcript, during the early part of this focus group, the researchers focused on land attributes and what trusts were trying to preserve with the goal of building an attribute-based model for the quantitative phase of the project. However, data logging and memo-ing allowed recorded input from subjects, who directed the research team towards a different economic model (which is discussed in the next section). Had the team proceeded in the original manner, there would have been a missed

an opportunity to refine the modelling process to present a „truer" reflection of the conservation easement market.

Data analysis: data coding and theme finding

Data coding comprises the heart of the data analysis, where researchers reflect upon each line of transcription, logs, and memos, to determine the content of each parcel of information. The content is then labelled by „codes" or themes (Spradley 1979). There are two general categories of coding approaches: open-ended coding and focused coding. Open-ended coding incourporates a line-by-line review of the data in order to apply multiple, broad-based categorisation during the coding process, which may be better suited for fields such as anthropology and sociology. Focused coding enables researchers to more tightly categorise specific topics, questions/answers, categories, and relationships. This is more applicable to economic research, which is underlined by well-constructed economic theory that is used to form a model. In this case, the codes that were chosen reflected potential economic variables and economic methodology.

In this coding and theme building example, most of the information came from one particular real estate appraiser, and her „monologue" was conducive to several economic themes. After themes were clustered from this entire session, it became clear that the real estate appraisers were actually discussing the constraints that were presented in the conservation easement market. Below is an example of a data log taken from the appraiser focus group in the demand-side study, where the data have been logged, memo-ed, coded and clustered into themes.

Transcription 2: Constraints that may impact land value

CK (researcher): In simplest terms, from our understanding, the value of a CE is determined from the value of a parcel of land unrestricted development rights minus the value of a parcel of land with restricted development rights. That"s our understanding. So of course the goal of a conservation easement is to place a value on some of the attributes or some of the features that are worth protecting.
Memo: Affirming the CE appraisal values. No one disputes this.

CK (continues): So consider the attributes of the land that your clients are wanting to protect.

WW (subject): Mmmmm. Hmmm.
Memo: She is putting a lot of thought into this, and is trying to connect with me.

CK: Mmmmm. Hmmm….What are the three most common attributes that you are asked to value as an appraiser?

WW: You know, my first thought is that you are *never* asked to value one or two components because an easement is always a whole package deal, OK?
Memo: First instinct is to look at the property holistically – as a whole, rather than as a part (attributes may be considered a part of the whole, or a vector.)
Coding: Attributes, or variables, contained within a vector.

WW (continues): Often at the beginning stages of an easement I do something similar to what JV (another research subject) does and that"s to meet with the landowner and I say, „OK, what are you…how are you going to use the land use after the easement?"
Memo: Use and future use of land is factored into the appraisal, I think.
Coding: Use and future land uses in the valuation process

WW (continues): And so we sort of work out…and what that means is what building size do they want to retain? But it also that means things like do they want to be able to keep mowed paths? Do they want to be able to trim trees to have views of the lake, or something like that?

Memo: Restrictions/constraints as a result of building size. Uses, all posed as restrictions or constraints!
Coding: Retained uses are a form of constraint?

WW (continues): Ah, but, so I sort of turned the question around in my mind and I thought of, „OK, what are the three things that have the most impact on land value?"
Memo: Breaks these down to three attributes, based upon what is most likely to impact land value. Do these attributes form a constraint?
Coding: Constraint

WW: And so, one is obviously limited building. You know, if you only have 40 and you're limited to put one house on it, maybe it's at the *back* of the 40 instead of the edge of the block, that's a *huge* impact on the value.
Coding: Development restrictions, spatial location (obstructing a view). All attributes and all possible constraints.
Memo: Interesting…spatial location within a property!

WW: The second one is no sub-division.
Coding: Continguity

WW: And this especially gets to be a big, big deal when you have large properties. You know, you may have a 300-acre site that allows for one five-acre building site – fine…If that five-acre site, if sold alone it would have a certain value, but what's that worth when it's carrying this huge albatross of another 295 acres that *has* to come with it!
Memo: From a valuation standpoint, large tracts of undeveloped land are a burden (note 'albatross' analogy). However, this is considered a really desirable feature from the trust perspective! May serve as both an attribute and a constraint.
Coding: Attribute and constraint

Theme finding: After clustering each of the demand-side focus groups into themes, patterns emerged that had not been originally considered. When all focus groups were clustered together, it became clear that the market for conservation easements actually reflected a non-market good, „a sense of place", rather than merely attributes.

To elaborate on this, the market for conservation easements has formed around protection of lands that makes communities special – signature parcels that make a community say, „This is what our community is all about. If this parcel of land is developed we will lose a key part of our community's identity." This message is clearly communicated in the following excerpts from Transcription 3, where focus group participants respond to the question of what their land trust or their community is trying to preserve. For the sake of brevity, memos and coding have been omitted from these excerpts.

Transcription 3a: 'Psychological connectedness' to the land

DD (participant): One of the things deals with location. Whether or not it's along the Hudson River or one of its tributaries, usually a first order tributary. Also if that area is connected physically or psychologically to a community – a riverfront community itself. People, I mean, not just ecological.

CK: Psychologically. Could you elaborate upon that? The psychological connection to the community?

DD: Um, I mean we've had many projects where there's a particular piece of land that the community has been using as long as, you know, Grandpa Jones can remember. And the community's been using it for hiking or for hunting, or fishing happens here or whether there's any number of things that have happened to families in the community. It's just known. There's

events that have happened at it that are not really sponsored by anybody that are just happening for years. And so when there‟s that kind of attachment, that usually helps the protection process. Especially…that wouldn‟t be the only protection criteria … especially if there are natural communities, scenic quality, there‟s historical. For us, there‟s historic buildings. Things like that are also important to protect.

Transcription 3b: 'Landscape of the region'

PF (participant): Well, this is only my, sort of my opinion as a relative newcomer. I think of this as the landscape that defines the valley. I mean, they are beautiful and you know you have a high desert, basically. This flat, high desert. You have the city of Boise which is characterised, I mean „du bois‟ is the trees. So it‟s, you know, it‟s this patch of green that‟s in the middle of this sagebrush desert. But then you have these Rocky Mountain foothills that rises above it. I think they form the landscape you know, sort of our landscape if they will. And so there‟s a very strong sense of preservation of it.

Transcript 3c: Keystone places

CB (participant): For me, I‟m looking for those *keystone places* that are in the location in the landscape that makes the difference. If you lost that piece, the rest would unravel. That the habitat quality is there or can be restored and that protecting that parcel reverses a threat – a *big* threat – to what are other conservation targets might be. (CK: OK) And then the last one is leverage. That protecting that parcel will help protect other parcels and will also be a connection to the communities, because if we don‟t have that community connection, it will never work. And a big part of our work on a landscape scale is working with those communities and making sure that they‟re „driving the bus‟ and they‟re saying, „Yes, this is what we want you to do‟ and we come in.

Transcript 3d: A sense of place

CD (participant): I‟m really thinking more about what I want to protect, like to protect, and there really is a lot more alignment with our organisation. Our organisation also is really active in getting communities to do green infrastructure plans and comprehensive plans. So that is something that we work a lot on, we‟ve had a lot of success with. So, number one for me is, „sense of place‟.

So for me that‟s the race track. Sense of place, really, includes a lot of things for me. And the building, historic preservation is, too. So, um, I think that these two loves of mine really form together and create a sense of place.

And the third sense of place is that people in the community act and interact to the open space and to the historic structures that are there and to the people of the community. So that‟s my third sense of place that I want to protect.

Results and discussion

After theme finding revealed that communities sought to protect a sense of place, questions to subsequent landowner focus groups related to „sense of place‟ were added. Landowner focus groups also revealed that landowners were concerned about preserving sense of place. Given these qualitative results a more thorough literature review was conducted to explore how to model „sense of place‟ quantitatively. The research team discovered an entire body of sociological and psychological literature that we otherwise would have been overlooked. Sociologists generally use *sense of place* to describe a multi-dimensional concept involving emotional attachment, satisfaction, and identity (Jorgensen & Stedman 2001). A person‟s *sense of place* is built from the meanings, symbols, beliefs, emotional attachments, qualities, experiences, and symbols associated with the various realms of a particular place (Williams & Vaske 2003).

This new-found knowledge affected the quantitative process in the following four ways:

1) *Modified survey language to reduce bias:* Not unexpectedly, the qualitative study provided guidance on the language that had the potential to create confusion or bias in the survey population. As demonstrated by Transcript 1, the terms „open space" and „natural areas", while commonly used in land protection projects, yield different meanings to different people. Even though „open space" is a qualifying criterion for conservation easement tax benefits, the team specifically avoided the use of this term altogether on the survey, to prevent introducing bias or confusion.
2) *Additional 'sense of place' questions included in the stated preference survey:* After conducting a literature review on „sense of place", the research team created a new „sense of place" variable in the stated preference survey. These likert scale questions built upon place-attachment indicators elicited from research by Cross (2001). Examples of these indicators include:
   a) „The people in our organisation have a personal attachment or "feeling of belonging" to the lands that our organisation protects." (community)
   b) „The financial well-being of people considering conservation easements frequently conflicts with conservation processes." (economic)
   c) „The people in our organisation seem to have a spiritual connection to the conservation values of the lands that we protect." (spiritual)
3) *Factor analysis of 'sense of place' and place-attachment indicators:* Heterogeneity of the sense of place indicators were analysed with in-depth factor analysis. The factor analysis was not part of the original quantitative economic model. Results from the factor analysis are discussed in another paper, and it was generally found that different dimensions of sense of place may impact easement choice.
4) *Identification of variables appropriate for a random utility model explaining easement choice:* The qualitative data collection process enabled the research team to choose five easement attributes (length of contract, access to property, percentage of payment, wildlife habitat, and production practices) for use in a random utility model in the stated preference segment of the survey. Moreover, in addition to these easement attributes a summated likert scale variable regarding sense of place was utilised to explain easement choice. While these specific results are left to different papers, the general conclusion is that both land trust and landowner respondents with high summated sense of place scores are more likely to choose to place conservation easements. This is certainly not a variable economic theory related to demand or supply would have predicted should be in the original quantitative model related to easement choice.

Summary and conclusions

There is already an abundant literature on mixed methods research, and many scientists view mixed methods research as a natural methodology to synthesise qualitative and quantitative research. In economics, mixed methods research is particularly germane to the collection of primary or survey based data, although this is a rather limited application of the methodology. Many economists do not engage in theoretical triangulation, and use a narrow qualitative research process. This is despite the fact that several researchers have shown that the specific qualitative process has the potential to affect the survey instrument and data that result from it. In the case of environmental goods, economists must be cautious about bringing preconceptions to the economic model or improperly specifying an economic model. In this multi-phase project, it has been shown that ethnographically-based qualitative research can yield refinements to economic surveys and modelling of preferences in the conservation easement market. This paper demonstrates some tools (data logging, memo-ing, coding, and theme-finding) and insights that may assist economists and other scientists who endeavour to implement non-market valuation or stated preference studies related to environmental goods.

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