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Analysis

More than wine: Cultural ecosystem services in vineyard landscapes in England and California

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ABSTRACT

Vineyard landscapes provide cultural ecosystem services (CES), which have been little studied in previous ecosystem services research. To fill this gap, we assess perspectives of wine producers and residents regarding CES provided by vineyards in two wine regions: Southeast England, an emerging wine area, and the counties of Sonoma and Napa, California (hereafter: Sonoma and Napa), a more traditional wine area. We used Q-methodology to reveal the perspectives expressed by participants from both areas, each of whom ranked 44 Q-statements. We found that wine producers and local residents have different perceptions. In Southeast England, wine producers are more positive about vineyard landscapes than residents. Wine producers in Sonoma and Napa value CES directly connected with wine production, while residents emphasize CES that benefit nature conservation or entertainment. Comparing the regions, we conclude that Southeast England vineyards represent sometimes unwelcome development to residents, while in Sonoma and Napa they represent conservation of nature and tradition. Our findings show that perspectives on CES are experience- and context-dependent, as the perspectives on vineyards of residents and wine producers are strongly held but vary widely. Understanding these perspectives will help land use planners and regional politicians make better decisions for optimizing available CES.

1. Introduction

A decade ago, the Millennium Ecosystem Assessment (MEA, 2005) found that around 60% of global ecosystem services (ES) were declining. Since then, research on ES has greatly increased, new classification systems such as the Common International Classification of Ecosystem Services (CICES) have been developed (Haines-Young and Potschin, 2012), and the concept has found its way into policy-making and planning, for instance with the UK National Ecosystem Assessment (2011) or the Green Infrastructure Strategy of the European Union (European Commission, 2013). Research on cultural ecosystem services (CES) has rapidly grown in recent years (Daniel et al., 2012; Milcu et al., 2013; Plieninger et al., 2015), however there is still more research done on non-CES than on CES (Bennett et al., 2015; Seppelt et al., 2011).

People benefit from CES, which in general are non-material, occur in natural or semi-natural physical settings, and affect people's personal state (Haines-Young and Potschin, 2012). Many authors stress the importance of CES for people, especially in industrialized countries; among other reasons, they play a crucial role to increase people's awareness and motivation for nature protection (Opdam et al., 2015; Orenstein, 2013; Plieninger et al., 2015). CES provide a connection between intrinsic values and the utilitarian and economic values often dominating ES approaches, which can hide the social–cultural values of CES (Schröter et al., 2014). This is important because currently CES often fall victim to decision-makers' preference for economic or ecological values (Milcu et al., 2013).

Landscapes provide a variety of ES including CES (Plieninger et al., 2015). Cultural landscapes are areas "designed and created intentionally by man" (World Heritage Centre, 2012, p. 88). Even though, in developed countries, the livelihoods of most people do not directly depend on landscapes, people have distinct relationships to and perceptions on the landscape surrounding them (Tempesta, 2010; van Zanten et al., 2014). Thus, changing landscapes entails a change of CES and also of people's perspectives on the landscape.

The growing, making, and selling of wine (wine production) leads to vineyard landscapes, which are both physical and cultural landscapes. Previous viticulture studies have talked about balancing provisioning, and regulating and maintenance ES in vineyards using ecological practices (Sandhu et al., 2012a; Viers et al., 2013). Other studies have looked into cultural meaning and heritage of vineyards (Harvey et al., 2014; Mitchell et al., 2012) and into different aspects of wine tourism such as perspectives of potential tourists (Getz and Brown, 2006; Quintal et al., 2015; Sparks, 2007). Hence, vineyard landscapes provide not

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only grapes, but also a variety of CES to people living among or visiting them. These landscapes are trademarks for their areas (Daniel et al., 2012) and special infrastructure, like educational trails, can attract additional visitors (Fiedler et al., 2008). Vineyards serve as motives for art, as places for spiritual activities like weddings, and as strong identity-creating landscapes representing also cultural heritage, such as the UNESCO World Heritage designation for vineyard regions like the terroirs of Burgundy. While other authors have included some vineyard CES in their studies (especially entertainment) (Sandhu et al., 2012b; Tompkins, 2010), we present the first comprehensive study of CES in vineyard landscapes.

In this paper, we seek to identify local perspectives on CES provided by vineyard landscapes, and how these vary depending on personal experiences. We selected vineyard landscapes because they provide both distinct physical landscapes and a special product culture likely to be valued for CES. We assess and compare perspectives on CES of people working in the local wine industry (wine producers) and of people living in the area, but not working in the wine industry (residents) in two wine regions: Southeast England, as an emerging wine-producing area, and in the counties of Sonoma and Napa, California (hereafter Sonoma and Napa), as a well-established wine-producing area. To assess individual perspectives on CES, we use Q-method, a discourse analysis tool (Brown, 1980; Webler et al., 2009) that has only been applied in a few recent studies about perspectives on ES (Bredin et al., 2015; Pike et al., 2015).

2. Case Description

We selected two wine producing regions for comparison. Both were in English-speaking areas, which facilitates a comparison of perspectives assessed based on ranking statements using Q-method. Both regions are currently dealing with climate change, with concerns about climate warming threatening traditional varieties and wine styles in Napa and Sonoma, while warming may open up new growing frontiers in southern England (Hannah et al., 2013). The Californian region has been the subject of long-term study by the second author (e.g. Nicholas and Durham, 2012; Nicholas, 2015; Nicholas et al., 2011), while the English region was under investigation as part of the European Commission-funded research project OPERAs, aiming to operationalize ecosystem services for policy and practice (http://www.operas-project.eu/). The selected case study areas differ greatly in size of wine production and producing areas, and the varieties of wines produced (Table 1).

England is not well-known as a winegrowing area. Since 2004, the producing area has nearly doubled, but harvested yield has heavily fluctuated (Fig. 1) due to extremely different annual weather patterns. The 2012 yield is less than half of the 2004 yield (Wine Standards Board, 2013), which shows that the area still faces challenges on the margins of climate suitability for winegrowing, even as the industry is rapidly expanding, concentrated in Southeast England. Climate change predictions for England, with drier summers and overall higher temperatures, are favorable for increasing future wine production (Jenkins et al., 2009).

Table 1
Comparison of key characteristics of the English and Californian wine industries, showing that the English wine industry is much smaller in all regards, with a striking emphasis on sparkling wine production, while the Californian industry is more diverse. All data are for 2012, except California wine types are from 2013. Sources: English Wine Producers, 2013; UKVA, 2012; Wine Institute, 2012, 2014a, 2014b.

	England	California
Number of winegrowers	432	4600
Producing area (in 1000 ha)	1.3	221.0
Average vineyard size (in ha)	3.3	39.9
Number of wineries	124	3800
Main wine varieties/style	60% sparkling wine	20% Chardonnay 13% Cabernet Sauvignon 9% Merlot

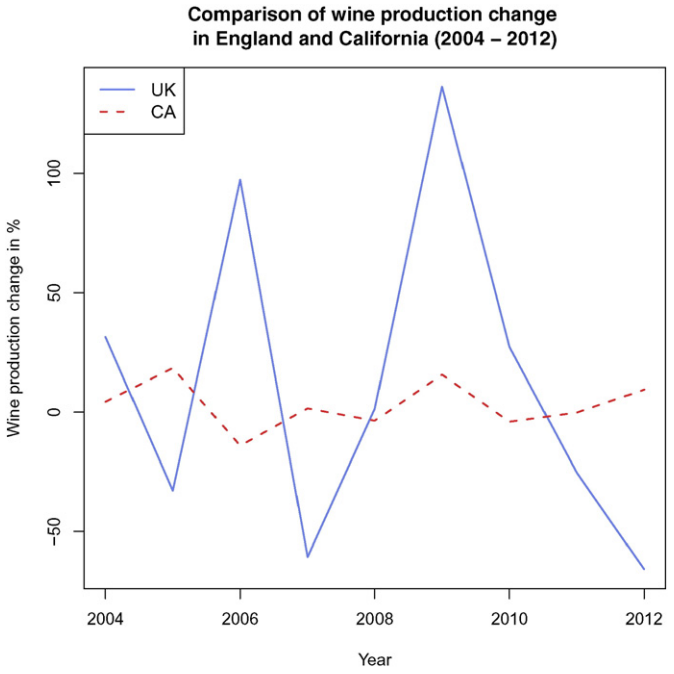

Fig. 1. Comparison of wine production rates (2004–2012) in England (blue, solid) and California (red, dashed). The percentage change rate is based on annual wine production compared to the previous year. Californian wine production fluctuates less than 20% over the years. In contrast, the production change rate for England reaches extremes in both positive (100% higher than the previous year) and negative (50% less than the previous year) directions. These variations in production reflect the more variable climate conditions in England. Data from Wine Institute (2013) and Wine Standards Board (2013).

On the other hand, the US is one of the largest wine producers in the world, with about 40% of the production volume of the leading nation, France (OIV, 2014). California produces 90% of the total US wine (Wine Institute, 2012). Both vineyard area and wine production have increased over the last decade. The wine-producing tradition is long, with the first recorded date of grape cultivation in the 1770s (Viers et al., 2013). The Californian wine industry not only produces wine, but also markets the natural assets of vineyard landscapes for tourism and local entertainment. As wine production is widespread in California, we concentrate our study on Sonoma and Napa, which are the most well-known winegrowing areas in California and have a well-developed visitor marketing strategy.

3. Methods

3.1. Classification and Assessment of CES

There are various CES classifications and terminologies (e.g. Chan et al., 2012b; MEA, 2005; UK National Ecosystem Assessment, 2011). In this paper, we use the CICES classification, which is widely adopted in research and policy, including the European Union Biodiversity Strategy to 2020 (Potschin et al., 2014) as well as in European research projects like OPERAs. CICES follows a standardized structure to better allow comparison between cases. CICES classifies CES in eleven classes: experiential use, physical use, scientific, educational, heritage, cultural, entertainment, aesthetic, symbolic, sacred and/or religious (here called spiritual), existence, and bequest (Haines-Young and Potschin, 2012). To our knowledge, we present one of the first studies that uses CICES for a comprehensive, semi-qualitative study on CES. We believe this is valuable because following CICES ensures that the full range of eleven CES classes is considered, and allows comparisons between cases.

Nonetheless, it is not entirely straightforward to use CICES for CES classification; many aspects leave room for interpretation, and CICES describes certain aspects that other classification schemes would understand more as a benefit rather than an ecosystem service. For example, CICES defines heritage as a CES, while it is a benefit for Chan et al. (2012b). Following the CICES thinking, we understand biodiversity as a CES in the existence class and as a regulating and maintenance service in the 'lifecycle maintenance, habitat and gene pool protection' group. Nevertheless, we recognize that biodiversity contributes on various levels to ecosystems, their functions and services and thus can be differently classified in other ES schemes.

CES are hard to value with economic instruments, because most CES are intangible and non-tradable on markets (Daniel et al., 2012; MEA, 2005). As result, economic valuations of ES usually ignore CES (Chan et al., 2012a) or undervalue them compared to people's choices (Malinga et al., 2013; Orenstein, 2013; Schaich et al., 2010). For the valuation of CES, not only economic values play a role, but also socio-cultural values, such as beauty or awe. Researchers increasingly use non-monetary, socio-cultural valuation methods to assess the total value of CES (Scholte et al., 2015).

Socio-cultural valuation incorporates individual perceptions and knowledge and can be assessed using qualitative methods like participatory scenarios (Plieninger et al., 2013) or mapping approaches (Brown and Fagerholm, 2015; Nahuelhual et al., 2014; Raymond et al., 2014), but also quantitative questionnaires (Martín-López et al., 2012). Especially in cultural landscapes, socio-cultural valuation gives a better understanding of people's perspectives on ES, as humans highly influence these landscapes (Martín-López et al., 2012). Recently, researchers have started to use Q-method as a form of socio-cultural valuation in ES research and have concluded that Q-method is useful to understand personal ES perceptions, and thus should be part of a toolbox of ES assessment methods (Bredin et al., 2015; Buchel and Frantzeskaki, 2015; Pike et al., 2015).

3.2. Q-method

We used Q-method to reveal people's perspectives on CES in vineyard landscapes. Q-method is a qualitative approach using factor analysis to identify social perspectives. Unlike a normal factor analysis, Q-method correlates subjects across a sample of variables (Brown, 1980). A crucial assumption of Q-method is that there are only a certain number of distinct perspectives that exist on each topic (Barry and Proops, 1999). The aim of a Q-study is not to achieve representative results, but to gain a better understanding of different perspectives on a certain topic. In our case, we are not aware of any studies about perspectives on CES in vineyard landscapes and the goal of our research is to gain first insights about existing perspectives.

A Q-study consists of four steps (van Exel and de Graaf, 2005; Fig. 2). First, the researcher identifies a topic and the group of people whose perspectives on the topic are of interest. Second, Q-statements on the topic must be retrieved. Third, Q-participants that represent the broadest possible view on the topic (but are not necessarily sampled to be representative of society as a whole) are asked to sort a set of given Q-statements into a forced quasi-normal distribution (Q-sort). Fourth, a factor analysis helps to reveal a distinct number of social perspectives on the topic. Ultimately, the factors identified help to understand different perspectives on the research topic (van Exel and de Graaf, 2005).

For the first step, we invited wine producers and residents living in either Southeast England or Sonoma and Napa, to participate, with the goal of representing as complete as possible of a spectrum of people concerned with wine production and local land use. In both regions,

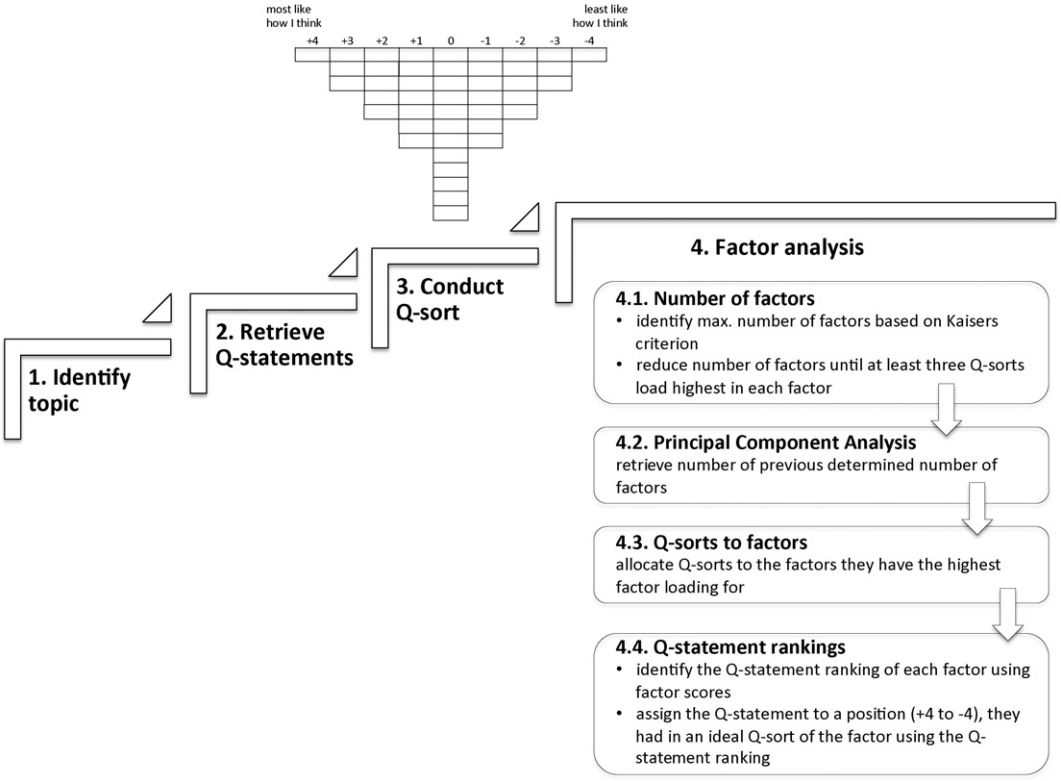

Fig. 2. Process of a Q-study, which has the aim to identify distinct perspectives held by participants. According to van Exel and de Graaf (2005), a Q-study has four steps: (1) the researcher identifies a relevant topic, (2) Q-statements are retrieved from the existing discourse, (3) Q-participants conduct Q-sorts, and (4) factor analysis helps to identify common perspectives. The factor analysis consists of four steps: First the number of factors is calculated with the Kaisers criterion, then the PCA calculates the factors. Afterwards the Q-sorts (one from each participant) are allocated to the factor they best fit. Last, the Q-statements ranking in each factor and their placement in a normal distribution is identified.

people with the following backgrounds were invited: government (local administration, elected councils (e.g., parish council)), business (tourism and housing industry), nonprofit societies (nature conservation, heritage, local societies), and wine industry (winegrowers, winemakers, and winery owners, collectively called wine producers). Participants were identified through desktop research (e.g., Sonoma County Winegrower Commission), public outreach (e.g., a letter to the editor in a local newspaper), as well as existing contacts in the wine industry from ongoing research collaborations (snowball sampling). While every effort was made to include participants from across interest groups in both study areas, the sampling strategy was not randomly representative, and thus results are not intended to be generalized beyond these cases.

For the second step, we derived 108 initial Q-statements based on previous Q-studies on people's perception of the environment generally (Bischof, 2010; Cairns et al., 2013; Capdevila and Rogers, 2000; Davies and Hodge, 2007; Dayton, 2000; Kalof, 2000; Kellert, 1998; Swedeen, 2006; Williams and Vaske, 2003) and on statements from homepages of wine producers in Southeast England (members of the South East Vineyards Association) or Sonoma or Napa. We classified these Q-statements into the eleven CES classes to ensure the full range of CES was represented in our study. For the final Q-study, we selected the four most diverse Q-statements in each CES classes, resulting in a total of 44 Q-statements (first column of Table 2), with the goal of including the broadest possible range of Q-statements.

In the third step, each Q-participant sorted the set of 44 Q-statements into a forced normal distribution (Fig. 2) in nine categories (from +4 to −4) in order to get a quasi-normal distribution of Q-statements, using the online software www.qsortware.com. The extremes were labeled 'most like how I think' and 'least like how I think' with no further labels as Q-sorts are self-referential (Swedeen, 2006; Woolley and Mccginnis, 2000).

Finally, with the help of factor analysis, we correlated Q-participants' Q-sorts to produce factors, which represent perspectives. This process can be divided in four steps: identify number of factors, conduct principal component analysis (PCA), sort Q-sorts to factors, and perform Q-statement ranking of each factor (Fig. 2). First, we identified the number of factors by extracting the amount of factors that had an eigenvalue > 1 (Kaisers criterion), as eigenvalues are a measure of the explained variance of each factor (Backhaus et al., 2003; Brown, 1980). Second, we used PCA to condense variables (Q-sorts) into factors by calculating the correlations of the variables and ascribing them to these factors according to their correlations (Backhaus et al., 2003), using the packages "psych" and "GPArotation" in R (R Core Team, 2013). Third, we assigned each Q-sort (aka Q-participant) to a factor based on its highest factor loadings (correlation between the computed factor and the Q-sort). Last, for each factor, we extracted its Q-statement ranking using factor scores, which indicate the ranking of the Q-statements within the factor. According to the ranking, we assigned each Q-statement in the category (+4 to −4) the Q-statement would have been, if an ideal representative of the factor had done a Q-sort. We then named each identified factor based on our interpretation of the most striking aspects of each factor.

As with most other qualitative research methods, Q-method does not produce results that can be generalized for a larger group as it aims to identify existing perspectives (van Exel and de Graaf, 2005). For this reason, we tried to get a broad variety of Q-participants to conduct the Q-sort, but representativeness was not a strict selection criterion for participation (Danielson, 2009). Thus, further research would be required to explain the motivations behind the identified perspectives with variables outside the Q-sort that were not measured here.

In the following, we illustrate the perspectives with comments from representatives of the perspectives, which Q-participants made after conducting the Q-sort in open-text responses. These responses provide more insight on the people and motivations behind the perspectives. We cite Q-participants using randomly assigned participant numbers, e.g. Q11 is a Q-participant loading highest in the Southeast English perspective Science. In order to refer to Q-statements, we use an abbreviation composed of a letter for the CES class and a statement number (1–4), i.e., A2 is the second Q-statement on aesthetic CES (Table 2).

4. Perceptions of Cultural Ecosystem Services in Vineyard Landscapes

We received a total of 42 responses, 20 from Southeast England and 22 from Sonoma and Napa. These represented around 55% wine industry and 45% residents in each case. These responses resulted in eight perspectives on CES in vineyard landscapes. Overall, our results suggest that people most strongly appreciate entertainment and bequest CES in vineyard landscapes, which most perspectives highly value. They intermediately value heritage and symbolic CES and only sporadically value scientific CES. In this section, we present the results, starting with the presentation of the four perspectives we identified for each case (Table 3) by describing their ideal Q-statement ranking and Q-participants highly loading for the perspective. Then, we outline differences and similarities between the cases.

4.1. Results of Q-study in Southeast England

We identified four distinct perspectives on CES in vineyard landscapes held by Southeast English wine producers and residents, which we call Science, Experience, Conservation, and Wine Culture based on their dominant features (Table 3). The four perspectives can be split up in two wine producers' perspectives (Science, Experience) and two residents' ones (Conservation, Wine Culture). Representatives in Science and Experience assign responsibility for environmental conservation to wine producers. While people in Science emphasize the importance of science for their occupation, the ones in Experience stress more personal experience. Land use change and nature conservation matter most for participants holding the Conservation perspective. Against this, people in Wine Culture appreciate most highly the entertainment activities in vineyards.

4.1.1. Southeast England Perspective 1: Science

Q-participants associated with the Science perspective emphasize science as a tool for wine production and the disinterest in (personal) emotional connections with vineyards. They highly value science as the "foundation for wine production" (C1) and as a strategic planning tool (C4), perhaps necessary to overcome the lack of wine production heritage (H4), the lowest-ranked statement. This perspective placed the highest importance on scientific and educational CES for wine production out of all eight perspectives identified. Science represents a wine expert's perspective, as people in Science stress terroir (X3, Y2), which is "the possession by a wine of a sense of place" (Goode, 2005, p. 25), and wine producers' duty to conserve natural resources (B2). They are indifferent to the CES classes entertainment, physical, and experiential and neglect spiritual (S1, S2, S3, S4) or aesthetic (A1, A2) connections with vineyards.

Men who work in the wine industry and have lived in the region for a long time dominate this perspective. The Q-participant loading highest in this perspective summarizes the perspective in open-text survey response: "… most wine producers in our region have few concerns about traditions and environment" (Q11).

4.1.2. Southeast England Perspective 2: Experience

Q-participants identified with Experience emphasize a combination of hands-on experience in wine production with environmental consciousness. They rank highest that wine producers "have a greater responsibility to produce wine than to provide an arena for recreational activities" (N1), although they rank low winemaking experiential heritage (H4) and cultural tradition (H1). Nevertheless, all positively ranked Q-statements deal with experiences and recreational activities in vineyards that link with wine production and wine itself, such as wine tours and tastings. Representatives of this perspective do not worry about land use change (H2, Y4). They enjoy vineyards as landscapes,

Table 2
The 44 Q-statements used in the Q-study, which were sorted by Q-participants to reveal eight perspectives on vineyard landscapes, shown by ranking numbers representing the category each Q-statement would have been ranked in, from +4 to −4, if an ideal representative of the perspective had done a Q-sort. Q-statements are sorted in alphabetical order of the 11 cultural ecosystem services classes from the CICES classification system, with codes for cross-reference to statements in the text. The ranking categories were determined by the computed factor scores, which indicate the ranking of the Q-statements within each perspective. Q-statements ranked positively have a green background, Q-statements ranked negatively have an orange background, with a more intense color the higher/lower the Q-statement was ranked. Thus, an ideal representative of the Terroir perspective would have ranked statement Y2 the highest and N4 the lowest. Some Q-statements have a negative connotation (marked in italics). Gray rows after the four Q-statements of each CES class give the overall rating of each CES class. These were calculated by summing up ranking positions of the four Q-statements, with the Q-statements in italics multiplied by −1 before adding to the sum, so that the result characterizes the strength of agreement with each CES class.

Location			Southeast England				Sonoma and Napa			
Perspectives			Science	Experience	Conservation	Wine Culture	Terroir	Tradition	Instrumental	Entertainment
Code	CES class	Q-statement								
A1	aesthetic	The vineyards in my region contribute to make it one of the nation's exceptional natural landscapes.	-3	1	-2	0	-3	2	0	3
A2	aesthetic	The inspiring views in vineyards are unique.	-2	2	2	1	-1	0	0	1
A3	aesthetic	Vineyards inspire art.	-1	1	-1	3	1	-2	0	0
A4	aesthetic	Vineyards show the structure of the underlying landscape in a beautiful way.	-1	1	0	1	0	1	-1	1
Overall rating of aesthetic CES class			-7	5	-1	4	-3	1	-1	5
B1	bequest	I owe a lot to the environment in vineyards.	2	-1	-4	-2	1	2	-2	0
B2	bequest	Wine producers have a duty to conserve soil, water resources and the living nature for the next generation.	3	0	3	3	3	2	3	1
B3	bequest	Wine producers are the stewards of a tradition created by previous generations with the task to preserve the vineyards into the future.	0	0	1	0	1	3	0	0
B4	bequest	Vineyards have a value in themselves.	0	2	2	0	0	0	0	-1
Overall rating of bequest CES class			5	1	2	1	5	7	1	0
D1	educational	Learning to produce wine means learning that there is so much more than textbooks can ever say.	2	0	0	-2	2	0	-1	2
D2	educational	A vineyard teaches you that nature is important for humans.	1	0	-2	-2	0	1	-2	0
D3	educational	During a visit to a vineyard, people can learn a lot about wine production as well as about wine.	2	2	1	0	0	0	2	2
D4	educational	Wine production can increase consumer interest in where food comes from and how it is grown.	1	2	1	0	1	1	0	2
Overall rating of educational CES class			6	4	0	-4	3	2	-1	6
N1	*entertainment*	*Wine producers have a greater responsibility to produce wine than to provide an arena for recreational activities.*	*0*	*4*	*3*	*-2*	*3*	*-2*	*1*	*-2*
N2	entertainment	On the whole, tourists attracted by vineyards benefit my region.	1	1	2	1	0	-1	3	3
N3	entertainment	Whether people want to just turn up and enjoy the beautiful countryside, or come en masse for a fully-tutored tour, tasting (and buying) wine with a dedicated and knowledgeable tour guide, they are welcome to visit vineyards.	0	2	1	0	-1	0	1	0
N4	entertainment	Vineyards attract valuable entertainment activities like festivals and balloon rides.	-1	0	-1	4	-4	-3	2	4
Overall rating of entertainment CES class			0	-1	-1	7	-8	-2	5	9
E1	existence	Natural protected areas should be established in places where nature deserves the most protection, regardless of the effects on wine production.	0	-2	4	2	2	-2	4	-3
E2	*existence*	*Vineyards detract from the natural beauty of the countryside.*	*0*	*-4*	*0*	*-1*	*0*	*-4*	*0*	*-3*
E3	existence	Vineyards provide a big benefit to society that is not provided elsewhere.	-1	1	1	-1	-2	1	-3	1
E4	existence	I enjoy the natural beauty of vineyards.	0	3	-1	1	1	1	-1	1
Overall rating of existence CES class			-1	6	4	3	1	4	0	2
X1	experiential	Vineyards contribute to a special food culture that can be experienced in local shops and restaurants.	1	1	0	3	2	0	1	3
X2	experiential	A vineyard is a valuable place to experience nature.	1	3	-3	-1	0	0	-2	1
X3	experiential	You can taste and enjoy in wine the changing nuances of season, place and vineyard parcel.	2	0	0	0	3	-1	-1	0
X4	experiential	Wine tastings are valuable to experience a vineyard.	1	3	1	1	1	0	0	2

Table 2 (*continued*)

Location			Southeast England				Sonoma and Napa			
Perspectives			Science	Experience	Conservation	Wine Culture	Terroir	Tradition	Instrumental	Entertainment
Overall rating of experiential CES class			5	7	-2	3	6	-1	-2	6
H1	heritage	For wine producers in my region, wine production is not only an occupation, but also a way of life and a cultural tradition that should be preserved.	0	-3	0	0	1	3	1	0
H2	heritage	The change away from traditional land use in my region ultimately weakens local traditions and identity.	0	-2	3	-3	-2	3	1	-3
H3	*heritage*	*Most people living in my region simply are not interested in vineyards.*	*1*	*0*	*1*	*-3*	*0*	*-3*	*-3*	*-1*
H4	heritage	My region has decades of experience dedicated to perfecting the art of crafting fine wines.	-4	-3	-1	2	-1	2	2	1
Overall rating of heritage CES class			-5	-8	1	2	-2	11	7	-1
P1	physical	Vineyards are a great setting for cycling.	-2	-1	0	2	-2	-3	2	0
P2	physical	Harvesting grapes at vintage is enjoyable work.	2	-2	-2	0	0	-1	-2	-1
P3	physical	Wine growing areas offer the opportunity to explore the surrounding countryside through walking or hiking on nearby trails.	-1	0	0	0	-1	-1	1	-1
P4	physical	Horseback riding near vineyards is a fun activity.	-1	-2	-1	2	-2	-2	-1	2
Overall rating of physical CES class			-2	-5	-3	4	-5	-7	0	0
C1	scientific	Science, not emotional reactions, must serve as the foundation for wine production.	4	-1	-2	-1	-3	2	0	-2
C2	*scientific*	*Expert knowledge of producing excellent wines is created by following traditional wine producing methods.*	*0*	*0*	*0*	*-1*	*-1*	*1*	*-1*	*-2*
C3	*scientific*	*Experience in wine production teaches much more than being in school.*	*0*	*0*	*0*	*-1*	*2*	*0*	*-1*	*-1*
C4	scientific	More holistic scientific analysis is required to fully understand the challenges facing wine production and point to appropriate solutions.	3	-1	-3	2	-2	0	1	-1
Overall rating of scientific CES class			7	-2	-5	3	-6	1	3	0
S1	spiritual	When you are out in the vineyards, you realize where humankind really and truly comes from and what life is really and truly about.	-3	1	-1	-3	0	0	-2	0
S2	spiritual	Vineyard areas help to fulfill spiritual needs.	-3	-1	-2	-2	0	-1	-3	-2
S3	spiritual	Being in the vineyards connects me to a larger spirit.	-2	0	-3	-1	2	-1	-4	-1
S4	spiritual	Weddings in vineyards celebrate the special nature of vineyards.	-2	0	0	0	-3	-1	0	0
Overall rating of spiritual CES class			-10	0	-6	-6	-1	-3	-9	-3
Y1	*symbolic*	*I prefer the view of a natural landscape to vineyards.*	*0*	*-3*	*2*	*1*	*0*	*-2*	*2*	*-2*
Y2	symbolic	Wine should be a bit like a fingerprint taken from the land – a unique expression of what the grapevine can achieve.	3	-2	-1	1	4	1	0	0
Y3	symbolic	My region has a unique wine producing tradition.	-2	-1	0	0	-1	0	3	0
Y4	symbolic	Changing the traditional land use in my region would mean that we destroy a part of ourselves.	-1	-1	2	-4	-1	4	0	-4
Overall rating of symbolic CES class			0	-1	-1	-4	2	7	1	-2

ranking "the natural beauty of vineyards" (E4) as third highest, and strongly disagreeing that they "prefer the view of a natural landscape to vineyards" (Y1). All Q-statements on heritage and symbolic CES of vineyards were negatively scored.

In Experience, most Q-participants work in the wine industry. The average time spent working in the wine industry is less than six years (Table 3). However, the average duration of residence in the region is more than threefold that. Q-participants in Experience characterize the Southeast English wine-producing area as "a new region so little tourism infrastructure and no wine heritage but it will come" (Q10). Overall, participants with this perspective "think positively about vineyards" (Q6) and describe the produced wine as "wonderful" (Q2).

4.1.3. Southeast England Perspective 3: Conservation

Q-participants loading high for Conservation focus on nature conservation and concerns about land use change towards vineyard development, which they see as a threat to nature. They highest rank a Q-statement (E1) prioritizing nature protection over wine production,

Table 3
Summary of the eight perspectives on vineyard landscapes identified in this research through Q-method with 20 participants in Southeast England and 22 in Sonoma and Napa. The eight perspectives were derived from factor analysis of the Q-sorts of the statements in Table 2, and given a descriptive name by the researchers. The term in bold under "key features" is the strongest trend (highest absolute value across the 11 CES categories, corrected for reverse-worded statements, which can be seen in the gray rows from Table 2 and the most or least extensive pie slices in Fig. 3).

Region	Perspective	Group	N	Gender	Average time of residence & standard deviation (in years)	Key features
UK	Science	Wine producer	8	7 male 1 female	23.1 (±17.3)	Wine experts; focus on **science**, perhaps to make up for lack of tradition. **No spiritual** connection to vineyards, but aspire towards and value terroir.
UK	Experience	Wine producer	4	2 male 2 female	18.3 (±15.8)	Hands-on producers; focused on **wine** production **experience** and the natural aesthetics of vineyards; little value on **heritage**. Environmental consciousness.
UK	Conservation	Resident	4	2 male 2 female	36.8 (±4.7)	Local residents; concerned about **land use change and nature conservation**; see threats from vineyard development locally, though may appreciate vineyards elsewhere. **Little spiritual** value for vineyards.
UK	Wine culture	Resident	4	1 male 3 female	42.5 (±17.4)	Long-term residents; focused on **entertainment** and environmental aspects; positive towards vineyards as part of **culture and fine living** including food culture, art, and cycling.
CA	Terroir	Wine producer	4	1 male 3 female	23.5 (±22.6)	Wine expert; focus on the exclusivity of wine and attendant **experiences**. Nothing special about vineyards per se, but the land itself is important. Need to protect nature, feel a spiritual connection, **anti-entertainment**.
CA	Tradition	Wine producer	5	3 male 2 female	16.6 (±12.4)	Long-term wine producers; see natural aesthetics of vineyards, which need to be protected as **traditional** land use, concerns about **land use change** away from vineyards, wine producers as **stewards**, cultural tradition and **heritage** of winemaking, experience and craft of wine production process.
CA	Instrumental	Resident	10	6 male 4 female	18.3 (±9.9)	Local residents; focus on land-based **benefits**, nature conservation, benefits of tourism and wine heritage, practical and applied importance of wine production for region, **no spiritual** connection.
CA	Entertainment	NA	3	2 male 1 female	24.0 (±10.4)	Positive towards economic and community benefits: **entertainment**, tourism, and education. Not focused on wine or vineyards for their own sake or specific connections with land; not threatened by land use change.

and highly rate the conservation duties of wine producers (B2), while they strongly disagree with feeling personally or spiritually connected to the environment in vineyards (B1) and vineyards as a "valuable place to experience nature" (X2). In addition, they highly rank Q-statements on land use change (H2, Y4), which stress that they are concerned about land use change causing identity and heritage loss.

Most Q-participants in Conservation are local residents, who have lived in the region on average for over 36 years. They felt that during the Q-sort, it was "difficult to prioritise" (Q12) and that they were "forced to be more positive than I wanted to be" (Q26) towards vineyards, due to the given number of Q-statements per category. However, their low passion for wine production in their own region does not mean that they have a generally negative attitude towards wine production as Q26 also stated, "I could enthuse about Savigny-les-Beaune and its vineyards."

4.1.4. Southeast England Perspective 4: Wine Culture

People with the Wine Culture perspective highly rate aspects related to aesthetics and fine living that derive from vineyard landscapes. In particular, entertainment activities (N4), inspiration for art (A3), special food (X1), and physical activities (P1, P4) contribute to a positive attitude towards vineyards, which might be surprising since the Southeast English wine industry is rather small. Nature conservation (B2) and protection (E1) are another priority. Symbolic, spiritual, and heritage CES are of the least concern, particularly the effects of land use change (H2, Y4) and spirituality (S1).

All Q-participants within the Wine Culture perspective are residents that have lived in the area for on average over forty years. Their comments reflect their positive attitude towards vineyards and wine production in the area: "The sight of our vineyard still makes me happy" (Q9). One participant reflected on "the tension between a highly managed productive landscape, and one that supports biodiversity" (Q7), stressing the importance of nature conservation for this perspective.

4.1.5. Cross Southeast English Perspectives

Five Q-statements (B3, C2, C3 N2, P3) are similarly ranked in all Southeast English perspectives. The only Q-statement that all perspectives positively scored is on the benefits of wine tourism (N2). On the other hand, a quarter of all Q-statements (B1, C1, C4, E1, H2, H4, N1, N4, X2, Y1, Y2, Y4) vary in their ranking positions by more than five positions (out of the possible range of nine) between the four perspectives. Two of these divisive Q-statements are about science (C1, C4), another two are about heritage (H2, H4) and three Q-statements on symbolic CES (Y1, Y2, Y4). This indicates that the importance of land use, its change and effect on identity, traditions, and heritage are strongly contested among the Southeast English Q-participants.

4.2. Results of Q-study in Sonoma and Napa

We identified four distinct perspectives on CES in vineyard landscapes held by wine producers and residents in Sonoma and Napa, which we call Terroir, Tradition, Instrumental, and Entertainment (Table 3). Terroir and Tradition represent wine producers' perspectives, while Instrumental is a perspective coined from residents. Due to the small number of Q-sorts in Entertainment (n = 3), there is no clear demographic assignment of this perspective. Representatives in Terroir and Tradition are critical about wine tourism, while the ones in Terroir emphasize the responsibilities of wine producers and the importance of nature conservation. Against this, people in Tradition worry about land use change. Participants holding the Instrumental perspective prioritize vineyards for the local economy and identity, and for nature conservation. Physical and experiential CES for people outside the wine industry matter most for representatives of Entertainment.

4.2.1. Sonoma and Napa Perspective 1: Terroir

The people associated with Terroir give the highest rankings to Q-statements on the uniqueness of wine (X3, Y2) and wine producers' responsibilities (B2, N1). Entertainment activities received the lowest ranking (N4). Experience is seen as important to produce wine (C3, D1), but participants with this perspective do not prioritize scientific knowledge for wine production (C1, C4). There is only one highly ranked Q-statement (S3) showing an emotional connection to wine production in this otherwise craft-focused perspective. Representatives of Terroir negatively rank Q-statements on CES provided to a wider range of people, such as aesthetic (A1) or (physical) activities like cycling and horseback riding for entertainment (P1, P4). They are rather

indifferent towards a change in land use and its effects on society (H2, Y4).

Q-participants in Terroir are wine producers. They have lived between 3 and 53 years in the region, but the range for how long they have worked in the wine industry is not as big (3–15 years). The participant with the Q-sort loading highest on the perspective highlights two sides of wine production: "I have fundamental doubts about the utility of tourism to wine production, but […] wine tourism is beneficial to a lot of people — just not those of us who grow grapes" (Q39).

4.2.2. Sonoma and Napa Perspective 2: Tradition

People associated with Tradition highly rank Q-statements concerned with issues of symbolic, heritage, and bequest CES, reflected both in the concerns for losing traditions and identity with land use change (H2, Y4) and the role of wine producers as stewards of a special cultural tradition (B3, H1). They negatively rank "Most people living in my region simply are not interested in vineyards" (H3) illustrating that people in the region have an interest in wine production. In addition, they rank three of the four Q-statements on bequest either +3 or +2 (B1, B2, B3). They view vineyards as part of the natural landscape (E2) and do not prioritize natural protected areas (E1). People in Tradition enjoy the beauty of vineyards (A1, A4) and see them as part of nature (E3, E4, Y1). They are negative about entertainment (N1, N2, N4) and physical use CES (P1, P2, P3, P4).

Wine producers dominate this perspective. On average, they have lived in the region and worked in the wine industry for over 10 years, likely contributing to their perspective of the importance of wine producers as stewards of the land and of a craft. Multiple Q-participants stated that the sorting helped them to be "more aware of the priorities" (Q37), but that they also struggled as "Many of the statements fel[t] like they 'should' be important to me but if I am honest, they really aren't" (Q33). One participant gave a comment concerning the perspective's emphasis on tradition of wine production: "… it is very important to the identity of the place" (Q30).

4.2.3. Sonoma and Napa Perspective 3: Instrumental

Q-participants of Instrumental are concerned about nature conservation, admit the (economic) importance of wine production for the region, but are not emotionally attached to vineyards. They most highly rank Q-statements on establishing natural protected areas regardless of the impact on the wine industry (E1) and the duty of wine producers to conserve resources (B2). They negatively assess Q-statements that describe vineyards as part of nature (D2, E4, X2), and instead prefer "the view of a natural landscape to vineyards" (Y1). However, people associated with Instrumental highly value the benefits of vineyards, including the unique tradition of wine production in the area (Y3), and the importance of wine tourism for the region (N2). Concerning the kind of tourism, they highly rank (physical) activities such as cycling (P1), events such as festivals and balloon rides (N4) and vineyard tours (D3).

The majority of participating local residents in Sonoma and Napa fell into this perspective, the largest in our study with 10 Q-participants, who on average have lived in the region for more than 18 years. These Q-participants "generally 'like' vineyards […], the associated benefits for our county" (Q40), think wine production "is very central to our economy" (Q45), and are "proud of where [they] live" (Q46). However, they also identify drawbacks, like the fact that "everything is related to wine production" (Q24) causing "conflict between economic growth, resource conservation and natural preservation" (Q43). The highest loading Q-participant summarizes the perspective: "… there are both positive and negative aspects of wine production in my region" (Q27).

4.2.4. Sonoma and Napa Perspective 4: Entertainment

Representatives of Entertainment mainly focus on entertainment activities surrounding wine production due to their benefits for the region (N2). Most of the top ranked Q-statements deal with how people can enjoy vineyards, e.g., during festivals and balloon rides (N4) in "one of the nation's exceptional natural landscapes" (A1), and the special food culture around wine production (X1), including educational and aesthetic CES. The negative ranking of Q-statements affirming that natural landscapes are preferred to vineyards (E2, Y1) show that people in Entertainment perceive vineyard landscapes to have high landscape value. Ranking two Q-statements on land use change (H2, Y4) −3 and −4 respectively, they voice that they do not think that land use change would weaken local traditions and identities.

Q-participants in Entertainment have lived for over twenty years in the region. Only three Q-sorts load highly for this perspective, which makes it difficult to give further information on typical demographics. The three Q-participants gave only few comments on their experience during the Q-sort itself.

4.2.5. Cross Sonoma and Napa Perspectives

The Sonoma and Napa perspectives share largely neutral to positive rankings for the Q-statement on the intrinsic value of vineyards (B4), while nine Q-statements (A1, C1, E1, H2, N1, N4, P1, S3, Y4) span more than five ranking categories. For example, the Q-statement on entertainment activities attracted by vineyards (N4) is highest ranked (+4) in the Entertainment perspective, while it is ranked in the lowest position (−4) in Terroir. Likewise, representatives of Tradition most value the Q-statement on the destruction of the personal identity due to land use change (Y4), whereas representatives of Entertainment least value this Q-statement. A ranking between +4 and −3 for E1, which is about natural resource conservation, is the third greatest rating difference, with Q-participants in Instrumental ranking it positively and people in Entertainment negatively. The two Q-statements on the effects of land use change (H2, Y4) are differently ranked in the four perspectives, most positively ranked in Tradition and most negatively in Entertainment. This shows the divergence of preferred CES among perspectives held within the Sonoma and Napa participants.

A special feature of the Sonoma and Napa perspectives is that they all recognize the economic and/or traditional importance of wine production for their region, although not all four stress the same aspects. In Entertainment, the importance of entertainment CES is emphasized and in Instrumental, symbolic and traditional CES are decisive contributors. Wine producers in Terroir or Tradition value symbolic CES, but are not enthusiastic about entertainment or physical use CES. They might perceive the emphasis on wine tourism as too much and too far away from wine production, and would rather like the region to refocus on wine more specifically.

4.3. Comparison of the Perspectives Between Case Studies

We compare the eight perspectives and present the differences and similarities among them based on the rankings themselves (Fig. 3), and on a Pearson correlation of Q-statement rankings of all perspectives.

Seven of eight perspectives positively value bequest CES (Table 2). The highest overall positively ranked Q-statement deals with the duty of wine producers to conserve natural resources for the next generation (B2), with benefits to consumers also positively or neutrally ranked across all eight perspectives (B3, D3, D4, X1, X4). All perspectives overall negatively rated the class spiritual, with Q-statement S2 on vineyards' contribution to fulfill spiritual needs the most overall negatively rated Q-statement. This might reflect a typical attitude to be found in Western developed countries in which spiritual attributes are not widely assigned to nature. Looking at the overall rating for symbolic CES, they are higher ranked in the Sonoma and Napa perspectives than in the Southeast English perspectives, which might reflect the fact that landscapes develop their symbolism over time, which Southeast England has not yet had time to develop, or it might reflect cultural differences between Southeast England and Sonoma and Napa.

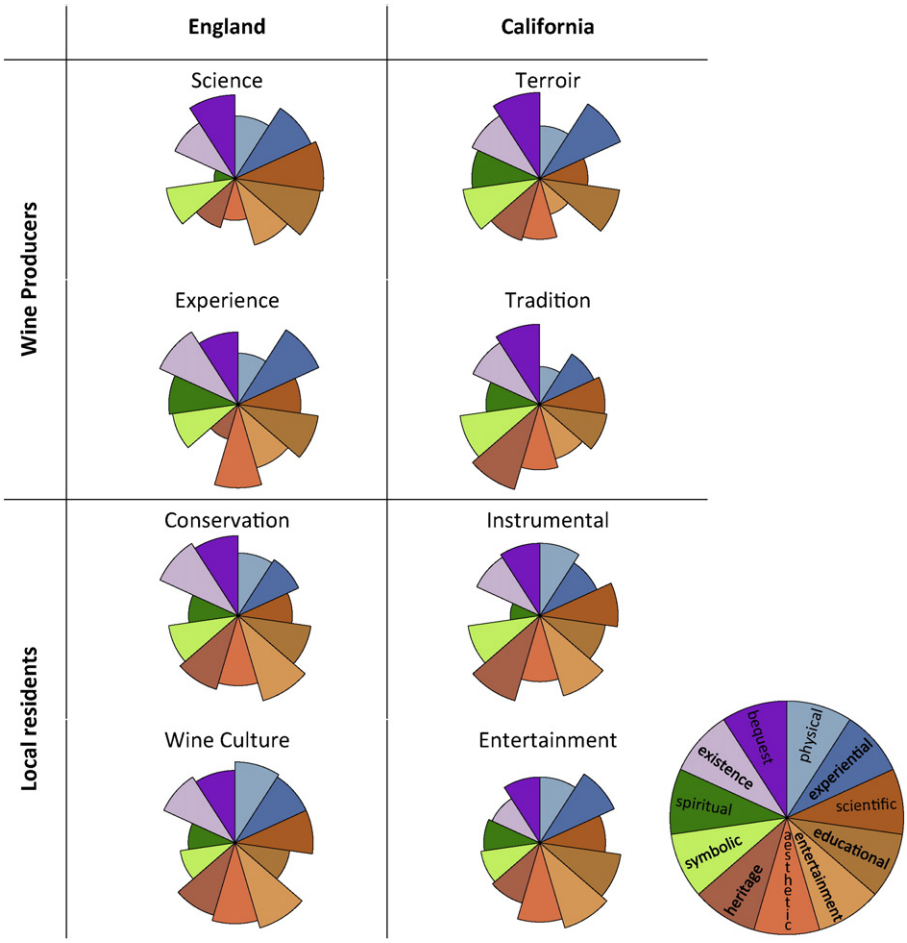

Fig. 3. Spie graphs of the overall ranking of Q-statements in 11 classes of cultural ecosystem services of vineyard landscapes between the eight perspectives identified in this research. The left column shows the Southeast English perspectives. The right column shows the perspectives in Sonoma and Napa. The overall ranking positions were calculated by summing up the ranking positions of the four Q-statements, accounting for negatively worded statements by multiplying by −1 if the Q-statement did not support the value of the CES class (e.g. N1, E2, H3). Different colors represent different CES, as shown in the legend on the right.

4.3.1. Correlations Between the Eight Perspectives

Testing the correlation between the Q-statement rating of the perspectives, we identified substantial correlations ($r > |0.5|$) between three pairs of Southeast English and Sonoma and Napa perspectives: Conservation (UK)–Instrumental (CA), Wine Culture (UK)–Instrumental (CA), and Wine Cultural (UK)–Entertainment (CA) (Fig. 4).

Instrumental (CA) positively correlates with two Southeast English perspectives, Conservation ($r = 0.54$) and Wine Culture ($r = 0.54$). Residents dominate in all three of these perspectives. Overall, they adopt a positive attitude towards the bequest and entertainment CES classes and a negative one towards spiritual (Fig. 4). They highly rank responsibility for natural resource stewardship for future generations to wine producers (B2). Nature conservation is important (E1). People in these perspectives prefer nature to vineyards (E4, Y4), and have no personal (spiritual) connection to vineyards (B1, S1, S2, S3). Nevertheless, they admit that there are benefits of wine tourism for their regions (N2). There are also some differences in ranking positions between the correlating perspectives. Representatives of Conservation value heritage less than the ones in Instrumental do, still both rank it overall positively. In contrast, Q-participants in Conservation negatively value science while in Instrumental people positively value it. For aesthetic and experiential, people in Wine Culture rank both positively overall, but the ones in Instrumental negatively rank these CES classes.

The Sonoma and Napa Entertainment perspective positively correlates with Wine Culture (UK, $r = 0.51$). The two perspectives are both dominated by residents who positively rank Q-statements on entertainment, aesthetic, and experiential CES, while negatively valuing spiritual and symbolic CES (Fig. 4). They especially highly value entertainment connected to vineyards, which coincide with their positive attitude towards experiential use and aesthetic CES. In both perspectives, representatives delegate responsibility to wine producers to not only produce wine but also to provide "an arena for recreational activities" (N1) in the vineyard landscapes. They are indifferent on Q-statements about terroir (X3, Y2) and the uniqueness of wine-producing areas (Y3), and do not worry about land use change (H2, Y4). The two perspectives strongly diverge in valuing existence and education CES: while representatives of Wine Culture positively rank existence and negatively education, the ones of Entertainment highly value education and negatively existence. Nature conservation (E1) is important in Wine Culture, while in Entertainment this Q-statement is negatively ranked.

4.3.2. Wine Producer Perspectives

In each region, we identify two perspectives dominated by wine producers. The wine producers' perspectives within each case study are distinct. In both regions, there is one wine producers' perspective (Science (UK), Terroir (CA)) whose representatives perceive wine and its production as something special and unique. They emphasize the Q-statements on terroir (X3, Y2), the duty of wine producers to conserve natural resources (B2), and the process of learning to produce wine based on experience and not only on academic knowledge (D1).

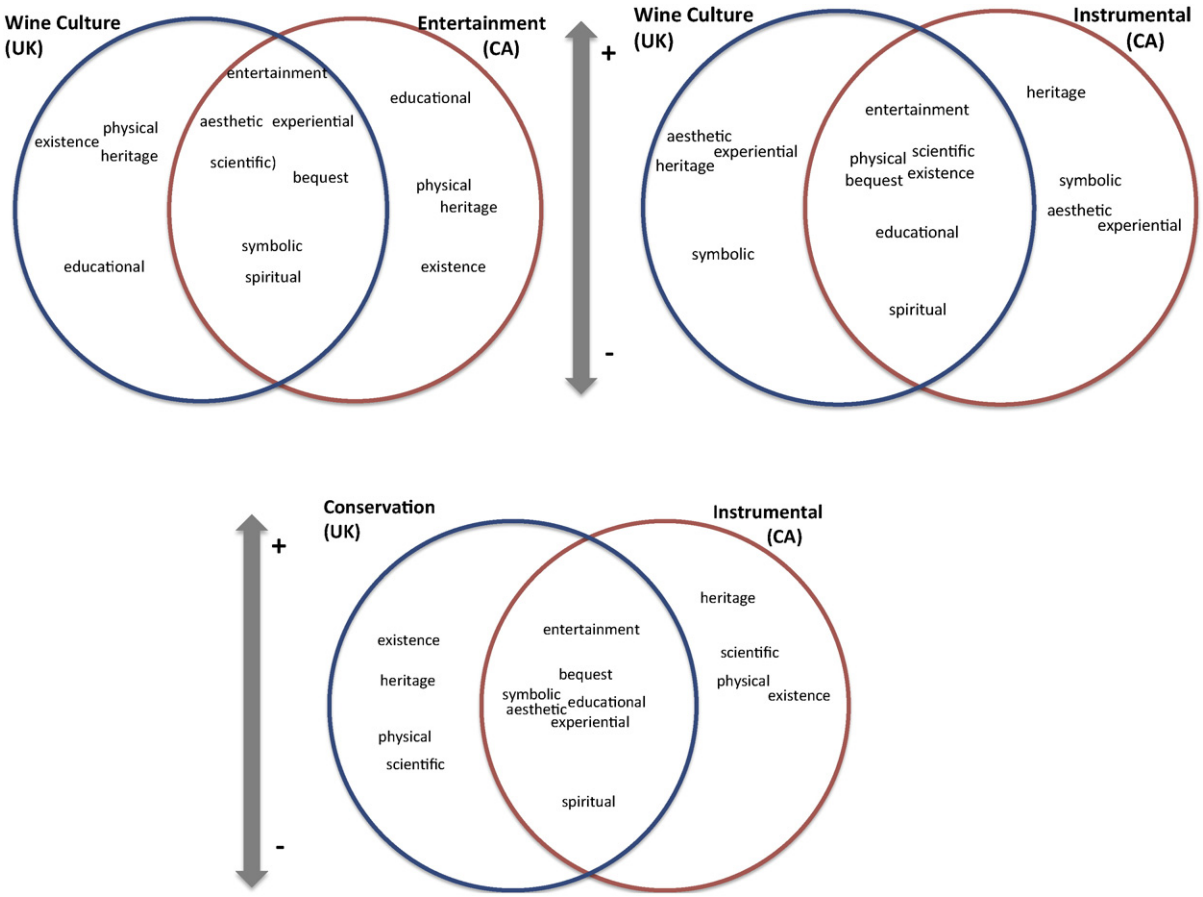

Fig. 4. Venn diagrams of the perspectives on cultural ecosystem services of vineyard landscapes identified in this research that have a substantial correlation ($r > |0.5|$): The diagrams show which of the CES classes the two perspectives rated similarly (in overlapping circle), and which of the CES classes were differently rated by the perspectives. The arrow on the side indicates that the higher in the circle a CES is, the higher ranked it is. The number in parenthesis after the CES class gives value when summing up the ranking positions of the four Q-statements in each CES class. The Southeast English Conservation perspective correlates with the Sonoma and Napa Instrumental perspective ($r = 0.54$; left upper corner). The Southeast English Wine Culture perspective also correlates with the Sonoma and Napa Instrumental perspective ($r = 0.54$; right upper corner). The Southeast English Wine Culture perspective correlates in addition with the Sonoma and Napa Entertainment perspective ($r = 0.51$; bottom).

Furthermore, they neglect the importance of activities connected to vineyard landscapes for non-wine producers (N3, N4), and are not worried about land use change (H2, Y4). Major differences of the perspectives concern the importance of science (C1, C4) and spiritual traits of vineyards. This shows that being a wine producer does not necessarily mean having an emotional personal relationship with vineyards.

In the other two wine producer perspectives (Experience (UK), Tradition (CA)), different CES are stressed and thus the perspectives are not comparable. Representatives of Experience emphasize personal experiences in vineyard landscapes, whereas the ones of Tradition focuses on heritage and symbolic CES provided by vineyards.

4.3.3. Perspectives on Land Use Change

Representatives in the Southeast English Conservation and in the Sonoma and Napa Tradition perspectives are heavily concerned about the effects of land use change on society (H2, Y4; Table 2). Except for this common trait, they have very little in common ($r = -0.02$). Comparing the two perspectives, Conservation stresses more Q-statements connected to nature and its conservation (B2, B4, E1, Y1), whereas Tradition emphasizes more the importance of wine production for the area (A1, B3, H1, H4). Q-participants in Conservation have lived more than twice as long in the region than Q-participants in Tradition (36.8 vs. 16.6 years). Interestingly, representatives of the Conservation perspective (UK) are residents, whereas the ones in Tradition (CA) are wine producers. This suggests that a change of land use concerns people that benefit from the currently dominating landscape.

Not very surprisingly, in all Sonoma and Napa perspectives, but especially in Tradition and Conservation, the symbolic and heritage CES of wine production are highly valued. Against this, in the Southeast English perspectives, wine production is not seen as a symbol of the Southeast English landscape or part of the heritage. The only exception is Wine Culture, in which some heritage value to wine production is ascribed (H4).

5. Discussion

We found that wine producers and local residents have different perspectives on the CES of the surrounding vineyard landscapes. Overall, our results suggest that people most strongly appreciate CES in vineyard landscapes of the entertainment and especially bequest classes. Scientific and symbolic CES are only sporadically valued. The appreciation of heritage and symbolic CES widely varies between the perspectives. In the Southeast English case, wine producers are more positive about vineyard landscapes than residents. Wine producers in Sonoma and Napa value CES directly connected with wine production, while residents emphasize CES that benefit nature conservation or leisure activities. Our findings show that perspectives on CES are experience- and context-dependent, as residents and wine producers have strongly held and varying perspectives on the CES provided by vineyards. We now turn to interpreting these perspectives in the context of previous research on (1) farming styles and (2) the relation to the landscape.

5.1. Farming Style

The farming style approach explains different farming strategies caused by a combination of external (e.g. economic, political) and internal (e.g. personal, structural) factors in order to improve the understanding of farming and enhance policies targeting farming activities in the long run (Morrison et al., 2012; Vanclay et al., 2006). Farming styles have their own rationale reflecting local conditions by prioritizing the various factors. Research has assessed and classified farming styles focusing on economic aspects in numerous locations and agrarian sectors. Previous research on farming styles in viticulture include an analysis by Brodt et al. (2006) on 40 almond and winegrowers in California, and of 142 grapegrowers in Australia (Mesiti and Vanclay, 2006). Despite findings that economic factors can only partly explain the adaption of a certain farming style, less attention is generally given to underlying personal perspectives that can motivate these farming styles (Feola et al., 2015). The perspectives we revealed in our study are a way of describing these underlying personal motivations that help to explain why and how certain farming styles are adopted, when economic factors alone cannot explain such decisions.

Brodt et al. (2006) identify two perspectives on farming styles, Environmental Stewards who prioritized nature conservation and Production Maximizers who focus on high yields and quality. We see similarities with our two perspectives from Sonoma and Napa wine producers (Terroir and Tradition). The Terroir perspective seems to be a mix of values from both Environmental Stewards (based on the importance of nature conservation, including for future generations) and Production Maximizers (they see the quality of the produced wine as wine producers' priority). Our Tradition perspective also shares the Production Maximizer's view understanding wine production as priority and giving less attention to nature conservation, but they had an emphasis on the traditional value of wine that Brodt et al. (2006) did not find.

Similarly, there are echoes of our Southeast English perspective Science in the farming style named Industry-Endorsed Early Adopter identified in a study on Australian styles in viticulture, which emphasized scientific knowledge as well as information access and network engagement in the industry to obtain knowledge and information (Mesiti and Vanclay, 2006). While we did not specifically study sources of information, as we recruited our Southeast English wine producing Q-participants from members in the South English Vineyard Association, we assume that they are all interested in industry networks. Previous research in Napa and Sonoma found that growers there prioritized their own experience and that of trusted colleagues, then university and government sources, with private sources including grower associations as less influential to their management decision making (Nicholas and Durham, 2012).

Our study and Brodt et al. (2006) both identify farming styles that stress the importance of natural conservation and the idea of stewardship, while Mesiti and Vanclay (2006) do not identify any farming style with ecological concerns in Australia. This could be based on the fact that they have not collected data on this aspect. However, they did identify an Australian farming style emphasizing the special nature of growing grapes as not only an occupation, but a way of life, which they called Traditional Grower. The emphasis on providing not only food products, but also a culture more broadly reflected in the surrounding landscape and society is a distinctive feature of wine production.

In both of our study regions, we found wine producers' perspectives (Science (UK), Terroir and Tradition (CA)) that emphasize bequest CES, with Tradition additionally valuing heritage and symbolic CES, and Terroir valuing symbolic CES. In an Australian case studying ES, a representative of the Australian wine industry identifies the same CES (Sandhu et al., 2012b). However, there are also differences, e.g. concerning entertainment CES. While the Southeast English wine producers seem to be rather neutral towards entertainment CES, Sonoma and Napa wine producers do not favor them, and the Australian representative from Sandhu et al. (2012b) did not see a direct dependence between the two. In Sonoma and Napa, there is a whole entertainment industry around wine, which might give wine producers the feeling that goal for agricultural activities is not focused on wine production for its own sake, but rather serves other interests. This highlights the different perspectives and their underlying motivations that can be observed in similar landscapes based on the local context.

5.2. The Relation to the Landscape

5.2.1. The Concern for Change

In both of our study locations, one perspective stresses the importance of the traditional landscape, and emphasizes the negative effects of a possible land use change. Representatives of the currently dominating landscape use load highest for these perspectives: in Southeast England, residents dominate Conservation, while in Sonoma and Napa, wine producers prevail in Tradition. At the same time, similar participants hold other perspectives that do not voice concern about land use change: the Southeast English residents' perspective Wine Culture and the Sonoma and Napa wine producers' perspective Terroir.

One explanation for the fear of land use change is the NIMBY concept ('Not In My BackYard'). While NIMBY has traditionally focused on physical developments (e.g., building new infrastructure) as a cause for resistance towards change, Devine-Wright (2009) suggests also considering emotional connections with the familiar environment when studying opposition towards change. Change of a place can disturb the personal or societal experienced place attachment and evoke place-protective behavior. This behavior frequently occurs when 'natural' places, which have been in the current way for a longer period, change due to a more economically attractive development (Devine-Wright and Howes, 2010). However, place attachment does not necessarily lead to a negative response towards change since it depends on the personal attachment and interpretation of the change (Devine-Wright, 2009). While residence time is one of the predictors for place attachment, strong place attachment can develop independently from residence length (Kaltenborn and Williams, 2002; Lewicka, 2011). This appears to be the case here, where we observed a wide range of residence time within perspectives (e.g., between 4 and 32 years for members of the Tradition perspective), as well as similar residence times between very different perspectives (e.g., Experience and Entertainment) (Table 3).

Our findings show two responses towards land use change. In the first case, representatives of the Conservation and Tradition perspectives have a strong attachment to the current landscape around them and are skeptical towards a physical change to a different landscape type, which stimulates a place-protective attitude, as seen in their high ratings for Q-statements H2 and Y4 on landscape change weakening local identity. On the other hand, Wine Culture and Terroir representatives who have even lived for a longer period in the region, interpret a potential change in a different way, either as not threatening or even as place enhancing, as seen in their negative ratings for these statements. We speculate that perhaps this is because they doubt the landscape will change, or because they have already lived through substantial changes.

5.2.2. Difference Between Wine Producers and Residents

We found that wine producers and residents perceive the CES in the surrounding vineyard landscapes differently. In each case study, at least one of the wine producers' perspectives mainly stresses wine production and attaches less value to less tangible CES, like aesthetic. Residents cherish more these intangible CES such as aesthetic or entertainment. Our findings fit with previous literature showing that users (who work in and make a living from landscapes) and beneficiaries (who do not directly depend economically on landscapes) use places differently and thus, appreciate and benefit from different CES. Martín-López et al. (2012) showed that beneficiaries of ecosystems (in our case the local

residents) favor CES, while users of ecosystems (in our case wine producers) focus more on the provisioning, and regulating and maintenance ES that benefit them economically. While place attachment literature describes residence time as one of the relevant factors (Lewicka, 2011), we did not observe residence time as an explanatory variable. We suggest the personal experience in and with a certain landscape type needs to be considered to achieve an explicit understanding of the different qualities of place attachment within a society.

5.3. Limitations of Q-method

We used Q-method to reveal people's perspectives on CES in vineyard landscapes. This approach is useful to understand the variety of valued CES, but nonetheless Q-method results cannot be generalized. To generalize, future research would need to do a quantitative, randomized survey to achieve representativeness.

Q-method also has other shortcomings: the given set of Q-statements and the forced normal-distribution can give Q-participants the feeling that they cannot completely express their view, as one of our Q-participants also expressed. We tried to counteract this constraint by including both positive and negative Q-statements and allowing the participant to sort only a few cards on each extreme end of the rating scale.

Another shortcoming is that for Q-method the only existing validity criterion is its replicability (van Exel and de Graaf, 2005). So far, no standardized Q-statements exist for any research question and there are no standards for selecting Q-statements (Webler et al., 2009). While we were careful to select Q-statements from the current discourse that represented a full range of views, this selection process is inherently subjective. To further reduce bias and make results more comparable among different studies, more standardized Q-statements could be helpful.

5.4. Limits of CES and CICES

We suggest that using an internationally agreed CES classification system like an adapted CICES scheme to ensure that a full range of CES are considered (i.e., all eleven classes) would be helpful to ensure comprehensiveness and comparability among CES studies, whether they use Q-method or another approach to do so.

While CICES is currently well developed for most provisioning, and regulating and maintenance ES, the CES section suffers from less precise terms and definitions, resulting in ambiguities in the use of the terms. Some CES are completely non-material (e.g. spiritual) while others are more material (e.g. physical), which causes different levels of intangibility. We faced a challenge when sorting Q-statements into the CES classes of CICES, as some of these classes seemed similar (e.g., horseback riding could be classified as entertainment, physical, or experiential) and others were hard to grasp (e.g. bequest, existence). We followed the existing definitions of CICES CES classes as best we could to allocate statements to the appropriate CES class, but recognize that this involved some subjective judgment.

Based on CICES, Vallés-Planells et al. (2014) present a classification, which completely revises the CES of CICES and includes not only individual, but also social aspects. This classification differentiates between 'self-fulfillment (personal)' and 'social fulfillment' classes incorporating the idea that there is an individual relationship, but also a relationship of a community with a place. In addition, the terminology is clearer, e.g. the groups of enjoyment are called 'passive enjoyment' and 'active enjoyment', instead of experiential use and physical use in CICES. Unfortunately, in the Vallés-Planells et al. (2014) classification, there is no class or group that clearly includes existence and bequest CES. Thus, we suggest further specifying CES in the CICES classification, along the lines of what Vallés-Planells et al. (2014) have developed, to improve the application of CICES in real-world situations and encourage studying CES alongside provisioning, and maintenance and regulating ES.

6. Conclusion

With our study, we characterize for the first time the full range of cultural ecosystem services in vineyard landscapes, and use these in a qualitative survey of local residents to reveal that there are various perspectives on vineyard landscapes formed by personal experience and local context. CES differ from other ES as they are hard to quantify, and thus, ES researchers must use different, less quantitative methods and approaches such as Q-method to assess and value CES. Our findings show that it is pivotal that ES researchers not only acknowledge the existence of CES, but also incorporate CES more in their research because without them, a major part of the services ecosystems provide for humans is ignored.

Every policy decision is not only a trade-off decision between ES, but also between who benefits from the ES. Different people have demands for different ES, especially for different CES depending on their personal experiences and their local context. Policy makers should promote approaches to vineyards that focus not only on vineyards as working landscapes, but on vineyards as ecosystems with a broad range of ecosystem services for humans.

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