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## Contents

Page	Author	Title
1-13	<i>Katrien Steenmans, Rosalind Malcolm, Jane Marriott</i>	Commercial waste: industrial symbiosis, legal and theoretical methods of circular economy
14-19	<i>Norazida Mohamed</i>	Financial Statement Fraud Control: Audit Testing and Internal Auditing Expectation Gap
20-28	<i>Ying Wang</i>	On Protection System of Juveniles in View of Public Interest Litigation
29-44	<i>Nicole C. Krämer, Gale Lucas, Lea Schmitt, Jonathan Gratch</i>	Social Snacking with a Virtual Agent – On the Interrelation of Need to Belong and Effects of Social Responsiveness When Interacting with Artificial Entities
45-59	<i>Nabin Baral, Sapna Kaul, Joel T. Heinen, Som B. Ale</i>	Estimating the Value of the World Heritage Site Designation: a Case Study from Sagarmatha (Mount Everest) National Park, Nepal
60-62	<i>Dan Zhou</i>	Letter: Some Thoughts on Improving the Quality of English Courses in Vocational High Schools

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# Commercial waste: industrial symbiosis, legal and theoretical methods of circular economy

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# Working paper presented at the SMART conference 'Life-cycle based management and reporting for sustainable business', 29-30 November 2016.

**Abstract.** Waste can be conceived as pollution or a resource; pollution in relation to the vast amounts of waste produced that need to be managed, while a resource in that waste can be used as the virgin material in production processes. In both cases, waste is currently most commonly treated as an economic good and thus commodified as a result of approaching the ownership of goods from a Blackstonian absolute dominion perspective. In this paper we present a critique of this classic form of property ownership as it aids linear cradle to grave approaches to waste. In advocating a move towards circular systems for using waste, we propose the adopting of a Lockean conception of property. For this purpose we address three issues: (1) current property rights in waste; (2) alternative approaches to waste; and (3) impacts of applying Locke's theory. First, we address when an object becomes classified as waste, who owns waste and when ownership changes hands. In discussing the latter, a critique of the classic forms of property ownership that support linear approaches is presented. Secondly, we investigate appropriate property regimes to address these critiques, namely extended producer responsibility and common-pool resource approaches. Finally, the seminal example of industrial symbiosis in Kalundborg, Denmark, is used to provide context for discussions using Locke's property theory on the feasibility and implications of our property rights discussions and recommendations. Industrial symbiosis is a structure where waste is exchanged between industries within a given network or grouping forming micro-circular economies. In this symbiotic network, waste is thus diverted from landfill and other forms of disposal, thereby lessening the impact of the waste stream on the environment and the economy.

**Keywords:** Property rights; waste; industrial symbiosis; common pool resources.

## 1. Introduction

One of the consequences of approaching the ownership of goods from a Blackstonian absolute dominion perspective<sup>1</sup> which is central to the western model of property ownership is that it tends to commodification. Indeed, the basis of this notion of property is that it is designed to aid trade and transactions in a linear economy. This presents problems for dealing with waste where waste is treated as a commodity which is bought and sold. Unlike other economic goods, waste is not desired or desirable. It is an economic 'bad', a consequence of a production and consumption society. Yet, it has become an object of 'trade' and the industry surrounding waste is based on private property concepts just like any other product which has become such an object of trade within the economy. It is axiomatic that waste is a problem – the production of waste grows despite all attempts to manage the problem<sup>2</sup> and its impact on the environment breaches all elements of the sustainable development principle.

In this paper we present a critique of the classic forms of property ownership that support linear cradle to grave approaches to waste, and propose adopting a Lockean conception of property in the context of waste. Adopting a Lockean conception of property firstly resolves a number of difficulties associated with the way in which waste is envisaged by positive law and, secondly, may provide a

more appropriately adapted means of dealing with the concept of waste in circular systems. To support this investigation, we consider the application of industrial symbiosis as a structure which enables waste to be utilised by other industries within a given network or grouping. In such a structure waste is exchanged between industries forming micro-circular economies. In this symbiotic network, waste is thus diverted from landfill and other forms of disposal, thereby lessening the impact of the waste stream on the environment and the economy.

## **2. Contextual background to waste**

There are growing waste crises as a result of the increasing amount of waste produced and to be managed.<sup>3</sup> In 2014, 2598 million tonnes of waste were generated by all economic activity and households in the 28 European Union (EU) Member States, equating to more than 5118 kg per EU inhabitant.<sup>4</sup> The current most prominent disposal and recovery operations to manage all this waste are landfill (43.6%), recycling (39.0%), backfilling (10.8%) and incineration both with and without energy recovery (6.5%).<sup>5</sup> These operations all highlight the extent to which waste is a sustainable development issue, as a result of its economic, environmental and social effects.<sup>6</sup> Environmental impacts of landfill can include air, groundwater, surface and soil pollution, as a result of methane gas that is released by the waste and as a result of the characteristics of the waste deposited in landfill.<sup>7</sup> Additionally, landfill occupies precious land space, being commonly situated on low-lying and low-value lands. These are increasingly difficult to find.<sup>8</sup> Despite the landfill rate of municipal waste having halved in the past two decades, a third of household waste produced is still sent to landfill. Incineration is often touted as an alternative to address the drawbacks of landfill. It however results in emissions of dangerous air pollutants and about a third of the mass burnt turns into ash, which then needs to be disposed of, often in landfill. Incineration can be used for energy recovery but again there are negative environmental impacts as a result of high levels of carbon dioxide emissions as part of the process.<sup>9</sup> In addition to these detrimental environmental impacts, waste represents an economic loss. It is estimated that materials sent to landfill in the EU could have a commercial value of around €5.25 billion per annum.<sup>10</sup> This is without including the cost of infrastructure required to collect, sort and manage waste. Lastly, landfill and incineration can have direct and indirect impacts on health including as a result of: methane from landfill contributing to climate change; air pollution caused by incineration emissions; risk of contamination of soil or freshwater, which can then be taken up in crops which affects crop yield and, in turn, food availability.

At the same time as this material is thrown away, there are ongoing resource crises. Currently, humanity's demand on the planet is more than 50% larger than what nature can renew: it would take 1.5 Earths to produce the resources to support current demand.<sup>11</sup> In this context, the mismatch between used material being irretrievably discarded and the exploitation of virgin material raises the type of ethical questions which are inherent in the concept of sustainable development. To address some of these questions waste can be used as a resource. The EU's 2005 Thematic Strategy on waste cemented the shift in perception that waste 'is increasingly seen as a valuable resource for industry'.<sup>12</sup> The strategy recognises the need to prevent waste and promote re-use, recycling and recovery to reduce negative environmental impacts, while simultaneously contributing to reducing overall negative impact of resource use. Other policies develop this further.<sup>13</sup>

The status of waste is further complicated. When waste is not used as a resource and has negative effects, there is still arguably the beneficial impact for the waste industry. This industry has grown in part because of the regulatory environment to deal with matters of disposal. It involves transport, disposal and recycling operations as well as complex legal and administrative decision-making around licensing and management. Waste is an economic good and the industry which has established itself around this good is high value.<sup>14</sup> This waste industry has societal benefits in that it creates jobs and generates profits. Waste thus has duality in that it is both an economic good and a bad. The commodification of waste is a complex matter with benefits and demerits across society.

Regardless of the conception of waste, one of the key issues about the production of waste is that the pollution effects of the waste management and disposal operations operate as externalities where a consequence (cost or benefit) of an (economic) activity affects other parties without this being

reflected in market prices.<sup>15</sup> Historically, pollution has operated as an externality, although attempts through such matters as taxation in the form of carbon taxes and landfill taxes alongside emission trading<sup>16</sup> have sought to internalise these costs. These are regulatory approaches but Coase argues that solutions to externalities lie in transactions where the market can solve externalities (through an efficient solution) if property rights are clearly assigned and negotiation is costless.<sup>17</sup> What Coase fails to address is that a transaction might not solve an externality but instead only compensate a private party for a demerit that they suffer individually. Coase's theorem does not challenge climate change or localised air pollution or the damage to aquatic ecosystems. Hardin's tragedy of the unmanaged commons<sup>18</sup> is a Coasian cost problem where Hardin uses waste specifically as an example of pollution to demonstrate why privatisation or state intervention are required to internalise externalities.<sup>19</sup> The tragedy stipulates that every individual, acting independently and rationally, will not recover or prevent production of waste if it is more expensive than discarding the waste.<sup>20</sup> These top-down solutions have been critiqued.<sup>21</sup> Instead it is argued that the most appropriate property regime depends on context.<sup>22</sup> Nonetheless, approaches to externalities often seem to rest upon a structure of private property rights.<sup>23</sup> The impacts of particular property rights in waste are investigated in the next section.

### 3. Who owns waste anyway?

Waste is currently treated within classic forms of property ownership. This is an issue when it comes to dealing with environmental impacts and externalities. Absolute dominion private property concepts sit uneasily in the continuum of a product from cradle to grave or during the process of manufacture. A product is the subject of absolute dominion private property during its useful lifetime. Once it is discarded then it assumes the character of waste. This moment in the lifetime of the product triggers regulatory controls. Likewise, the waste generated during production leaves the factory gate in a different fashion to the product which was the purpose of the manufacturing activity. The problem with waste is its potential to damage the environment and if nobody wants the waste then this potential is exacerbated. If the object leaves our hands or the factory gate as waste which is unwanted then the external impacts on the environment are likely to be greater than that of the product which is integrated into a cycle of use. There are two points which arise here:

- when does the object become classified as waste, and
- who owns waste and when does ownership change hands?

In this part we consider these two points in the manufacturing process and ask whether current arrangements are the most effective for dealing with the externalities caused by waste. For the purposes of this paper we are focussing on waste in the manufacturing process because we are examining industrial symbiosis networks which exchange waste forming micro-circular economies.

#### *3.1 Definition of waste (when does the object become classified as waste?)*

Definitions in law are important,<sup>24</sup> especially in a system of regulatory control where what can and cannot be controlled,<sup>25</sup> and when, needs to be defined. Legal definitions should be sufficiently wide to cover what needs to be controlled, while simultaneously adequately guiding behaviour and avoiding over-regulation.<sup>26</sup> Additionally, the EU definition of waste has an international impact as the EU and international conventions are 'mutually influential'.<sup>27</sup> The EU definition is found in the 2008 Waste Framework Directive<sup>28</sup> (WFD).

Waste is defined in Article 3(1) of the WFD as 'any substance or object which the holder discards or intends or is required to discard'. The primary objective of the WFD supported by this definition is the protection of the environment and human health through the prevention or reduction of the adverse impacts of the generation and management of waste, and by reducing overall impacts of resource use and improving the efficiency of such use.<sup>29</sup>

The number of cases on the definition of waste indicates the complexity of waste regulations. <sup>30</sup> Most of those cases were decided before the most recent 2008 WFD implementation, but the European Commission guidance on interpretation of key WFD provisions considers case law decided under repealed directives relevant, albeit not legally binding.<sup>31</sup> Additionally, the changes the WFD introduced have arguably not substantially altered the definition. One of the changes only occurred in

the English language ('dispose' was replaced with 'discard') indicating the change was for linguistic rather than substantive reasons.<sup>32</sup> The other change to the definition was removal of reference to an annex which case law had already established could not be relied upon to determine whether a substance was waste.<sup>33</sup>

The current definition of waste and the relevant case law have three effects: (1) what can and cannot be controlled is unclear; (2) when a material or substance becomes regarded as waste lacks clarity; and (3) it is questionable whether the current approach actually protects the environment, which is one of the objectives of the WFD.

First, what counts as waste has to be determined on a case-by-case basis as there are no set characteristics of waste. The outcomes of the cases on the definition of waste have indicated that waste should be interpreted widely rather than restrictively. For example, the actual subjective intention of the holder of waste is excluded,<sup>34</sup> the possible financial advantage of reusing the substance is irrelevant<sup>35</sup> (even if a substance is a reusable residue, it can still be considered waste<sup>36</sup>), and leftover stone of the same composition as the rock from which it was quarried, that was stored awaiting subsequent use, can be classed as waste.<sup>37</sup> As a result of this wide interpretation, in reality the extent to which there is uncertainty is debatable; if there is any uncertainty whether a substance or material is waste, it should be treated as waste as the definition is so broadly cast.

Secondly, it is unclear at which point material first becomes regarded as waste. Under the definition, a material becomes waste when it is discarded. There is, however, 'considerable dispute' over when this is the case. <sup>38</sup> Krämer acknowledges that often a case-by-case examination will result in deciding beyond reasonable doubt when a material has been discarded.<sup>39</sup> He provides the examples of placing furniture outside the home before the official collection of bulky waste takes place, and placing bottles in a bottle bank, as examples of when a material becomes waste.<sup>40</sup> The point at which a material becomes waste is significant, as this affects when waste law and policy begin to apply.

Thirdly, Malcolm and Clift have summarised the effect of the case law on the definition of waste within the context of industrial symbiosis by questioning whether the current approach actually protects the environment, which is part of the WFD's objective, as environmental risks associated with the material itself or with its intended life-cycle do not affect classification as waste or product.<sup>41</sup>

These shortcomings of the definition of waste have been acknowledged in the literature. Nonetheless Krämer and Pocklington argue against changing the definition as there would be a number of unwanted knock-on effects as thousands of national, regional and local laws are aligned to this concept of waste.<sup>42</sup>

### *3.2 Property rights in waste (when does property in waste change hands?)*

The second question relates to the ownership of waste. Again, this question arises in two contexts: one involves the ownership continuum of the manufactured product; the other the material which emerges at the factory gate as waste. In this paper, our concern is mainly with the second category as it is this waste which is the subject of industrial symbiosis networks. Such waste is traditionally subject to disposal operations and, depending on the nature of the waste, it is flushed through sewerage systems or into a watercourse; removed by vehicular transport for ultimate disposal elsewhere; or, emitted as an atmospheric emission through a chimney. The nature of an industrial symbiosis network is that the material is taken by another plant in the network which utilises it as a resource (which is likely to replace a raw material).

This paper limits its discussion to different types of properties as described by Clarke and Kohler,<sup>43</sup> and relies on Hohfeld's conception of rights.<sup>44</sup> Hohfeld criticised the assumption that all legal relations, including property, can be reduced to rights and duties, and instead distinguished four kinds of entitlement that are commonly and indiscriminately subsumed under right: right, privilege, power and immunity.<sup>45</sup> The former is also known as just right, but it is acknowledged that claim is synonymous to this, so to avoid confusion, using claim-right when referring to right in Hohfeldian terms, and right if in general terms. Hohfeld expresses the kinds of entitlement in a scheme of opposites and correlatives.<sup>46</sup>

Ownership of waste which is subject to some form of disposal is mixed. When it leaves the premises in the form of an atmospheric or aqueous emission then nobody owns it – it is the ultimate externality – and likewise when it is flushed into a watercourse. It is *res nullius* -owned by none - ‘no-property’ or ‘open-access’, in other words a regime where the resource is open to all, so that, in Hohfeld’s terminology,<sup>47</sup> everyone is at liberty to use it but has no enforceable claim-rights to the use of it enforceable against others or against the state. Of course, regulation might control these two types of emission forcing the transactional cost of disposal on the manufacturer. But the problem with such waste is to persuade others of its value and to create a desire for ownership and/or control. The problem is not that everyone wants it when it is floating in the air or the river but that no-one wants it.

If the waste is removed by municipal authorities then ownership is likely to pass on collection. Discarded in the WFD waste definition can be a way of stating that ‘its owner ceded ownership’.<sup>48</sup> Cessation of ownership may be equated with the abandonment of ownership. This is however not the case in the context of waste as Article 36(1) of the WFD states that ‘Member States shall take the necessary measures to prohibit the abandonment... of waste’ (emphasis added). Instead, what happens when waste is discarded is that there may be a transfer of ownership. To whom this transfer of ownership is depends on the waste management procedure adopted by the company – e.g. if have a permit to store waste or transfer waste elsewhere, or have a contract with a waste collection company or another company to transport waste to their premises. This raises interesting questions where collection might be delayed – a bank holiday, for example, or a strike. Then, if ownership remains with the manufacturer, responsibilities (or duties in Hohfeldian terms) will also follow. Alternatively, ownership might pass when a contractual relationship is entered into between the manufacturer and the disposal organisation. In which case, claim-rights and duties are established at that point. Where waste is private property this means that there is a right to exclude. Indeed, Merrill argues that the right to exclude is a necessary and sufficient condition of identifying the existence of property: ‘Give someone the right to exclude others from a valued resource, i.e. a resource that is scarce relative to the human demand for it, and you give them property. Deny someone the exclusion right and they do not have property.’<sup>49</sup>

But the widely accepted view amongst property theorists is that ‘property’ should not be limited to absolute exclusionary private ownership and private use rights.<sup>50</sup> This view recognises that the concept of property is broad and fluid and evolves with society meaning that we may need to recognise new types of property rights.<sup>51</sup> It is becoming necessary to consider waste in such a way where the desire is to abandon this piece of property and the necessity is to encourage its evolution as the lynchpin of a circular economy.

Waste as communal property would apply to waste in the sky or the river. This is distinguished from no-property. As communal property every member of the community has the privilege to use the thing AND a right not to be excluded from it, and consequently everyone else in the world has a correlative duty not to interfere with their access to it. This type of property in waste could be open access (where everyone in the world is a member of the community) or limited access communal property (where there is closed or restricted access to a limited community) and each member of the community has both the privilege to use the resource (everyone else in the world, whether a member of the community or not, has no right to object). They also have the right to exclude all non-members of the community. For waste, the latter might be more appropriate to apply to waste more widely (beyond waste in the sky or river) in that members of a network or group – perhaps a Symbiosis Centre –can pool their waste, which is then used by others. This will only work if waste is perceived to have value so with this type of property there is again the need to drive waste reuse and recovery. If waste was open-access, well-intended individuals, in terms of re-using, recovery and recycling waste in an environmental manner, can interfere with others’ waste to ensure that it is managed properly, with others having no right to complain. Simultaneously, this means others could use or manage waste in a manner detrimental to the environment. It might, of course, be thought appropriate to impose duties on waste, but as there is no property in waste, a significant difficulty arises in how to impose or enforce those duties.

Waste could be owned by the state in a structure where individuals can still be allocated use rights of various types, or even limited management or control rights, but not property rights in the sense that such rights would be personal to holders and not transmissible. For example, if the municipality owns waste, then questions occur such as at what point do they own it – once it is discarded? Or is it once created? – E.g. discard may not have taken place, but waste may be stored. Or once bins are collected and the waste management companies have interests? – I.e. waste management companies acting on behalf of municipality. What would be the incentive for local authorities to be owners? Or should this just be part of their responsibilities? Further, it also does not mean that the authorities are currently participating in industrial symbiosis.<sup>52</sup>

The question is thus how should waste be managed? In particular, in the next section, we look at how waste should be managed to support industrial symbiosis networks exchanging waste.

#### 4. Moving towards non-linear approaches

##### 4.1 *Managing property rights*

The current linear society is consumption based where the aim is to own goods. There is no consideration beyond private ownership and this results in a short-term view of materials. The question arising from the discussion in the previous section is: what are appropriate property regimes to move away from this approach? We consider two possible options: extended producer responsibility (EPR) and common-pool resources (CPR).

The first possible option is using constructs such as leases, where EPR may have a role. Under this concept, the responsibility is shifted from consumers and authorities, the traditional assignees, to the producer of the products.<sup>53</sup> In the WFD EPR is recognised as

one of the means to support the design and production of goods which take into full account and facilitate the efficient use of resources during their whole life-cycle including their repair, re-use, disassembly and recycling without compromising the free circulation of goods on the internal market.<sup>54</sup>

EPR extends the responsibility of the natural or legal person who professionally develops, manufactures, processes, treats, sells or imports products (producer of product) to deal with the waste.<sup>55</sup> What producer responsibility entails and the length of it is not defined in the

WFD, nor in its accompanying guidance document. <sup>56</sup> Instead, Member States may take legislative or non-legislative measures to implement EPR, and possibly define it. EPR aims to internalise the externalities of the supply chain through designing the reversed supply chain.<sup>57</sup> In Hohfeldian terms: the producer has the privilege and the consumer has the duty to return to producer (which may be a qualified right).

But EPR is currently limited in its application. Another option is common pool (or communal) approaches to the ownership and management of waste which are more appropriate to addressing critiques of linear approaches. CPRs are economic goods which are subtractable and non-excludable. A good is subtractable (also known as rivalrous) if once a good has been exchanged, it is no longer available for others to use. The goods exchanged in industrial symbiosis, wastes and by-products, are both subtractable, because if wastes or byproducts are used by one organisation, they are no longer available for other organisations to use in their production processes. Exclusion, or control of access, ‘relates to the difficulty of restricting those who benefit from a good or service’.<sup>58</sup> This can both be in terms of physical exclusion devices or derive from other sources including the law of property, and its arguably constituent right to exclude.<sup>59</sup> If there is a problem of exclusion, there is no legal entity that has the right to exclude others from accessing the resource. Difficult or costly exclusion provides a strong incentive for potential beneficiaries to free-ride. The free-rider problem occurs when those who benefit from goods or services do not contribute to their provision or maintenance.<sup>60</sup>

Beyond the determining characteristics of subtractability and non-excludability, CPRs have been defined as comprising ‘resource systems and a flow of resource units or benefits from these systems’.<sup>61</sup> Examples of CPR systems include lakes, rivers, irrigation systems, and forests, with water and timber as the resource units or benefits from the CPR.<sup>62</sup> Even though examples of CPR



systems are typically natural resource systems, CPR systems can also be man-made.<sup>63</sup> Industrial symbiosis is a man-made system with waste the resources units from the CPR.

There are two main motivations for defining industrial symbiosis and the exchanged waste as a CPR system and CPR units. First, the characteristics of CPRs match those of industrial symbiosis and waste, as described in the previous paragraph. Salmi and others have recommended that industrial by-products in the industrial symbiosis between heavy industries in the Gulf of Bothnia, in Finland, should be redefined as CPRs.<sup>64</sup> Waste has also been described as a CPR by Cavé.<sup>65</sup> His arguments mirror those in the previous paragraph in relation to subtractability and non-excludability: the concept of CPR

converges with our characterisation of [solid waste] deposit: we have observed both eviction effects (within the service modernisation process) and resource overuse problems (of which appropriation conflicts are the symptom).<sup>66</sup>

Park and Louka however argue that waste is not a CPR because waste is generally perceived to be of low value, an externality to society, and ‘one could hesitate to call waste a resource’.<sup>67</sup> Park and Louka have misinterpreted Ostrom; non-excludability and subtractability are the determining characteristics, rather than value, and whether an externality or a resource. Value may influence subtractability and excludability. For example, Ostrom has recognised the effect of value in relation to CPRs as the incentive to appropriate high value resources from an unregulated, open-access CPR system may be higher than low-value goods.<sup>68</sup> This however does not affect the material’s subtractability. It may affect excludability in that if the incentive is higher to appropriate, then excludability may be more costly or difficult, but this affects the extent of the problem of excludability rather than whether excludable or not. In relation to the third argument, waste is often considered as a resource as discussed earlier.

Secondly, some of the benefits of a CPR governance system have been identified by Salmi and others,<sup>69</sup> and Schiller and others.<sup>70</sup> These benefits include reliability of flows, costs and clear definitions. The discussions of these benefits are however limited to their identification, and neither unpack the particular benefits and their implications, nor explain whether or how these benefits are being achieved in any case studies. Lombardi and others stated that

[i]f it can be shown that the benefits ... of a CPR system are indeed greater than dependence upon open market systems, CPR may become another useful tool for the [industrial symbiosis] community to employ.<sup>71</sup>

There are also some general advantages of CPRs that could prove useful for industrial symbiosis. In Ostrom’s *Governing the Commons* <sup>72</sup> joint use of the CPR resulted in communication between individuals and establishment of agreed-upon rules and strategies, which combined resulted in improved joint outcomes. These characteristics have proven key in industrial symbiosis.<sup>73</sup>

#### 4.2 *Kalundborg industrial symbiosis*

This section so far has suggested two options for addressing limitation of private property approach to move away from linear systems. These together with the property rights discussions in Section 3 are now presented in the context of industrial symbiosis. Industrial symbiosis has been identified as a supportive strategy of effective waste management and the circular economy in the 2011 Roadmap to a Resource Efficient Europe,<sup>74</sup> 2012 European Resource Efficiency Platform<sup>75</sup> (EREP) and 2015 Circular Economy Package.<sup>76</sup> The 2011 Roadmap outlines how Europe’s economy can be transformed into a sustainable one by 2050. The EU Commission identified that industrial symbiosis could support sustainable production and consumption, and that Member States should continuously work together to make the best use of wastes and by-products they produce by, for example, ‘exploring’ industrial symbiosis.<sup>77</sup> In the policy recommendations of EREP, it was stated that ‘EU and Member States should foster industrial symbiosis by promoting a pan-European network of industrial symbiosis initiatives, under which facilitators could be connected to allow match-making, including across borders and beyond the EU’.<sup>78</sup> The objective of EREP is to provide high-level guidance to the EU Commission, Member States and private actors on the transition to a

more resource-efficient Europe by aiming to secure a doubling of resource productivity compared to pre-2008 crisis resource trends.<sup>79</sup> Following the initial recommendations of EREP, the European Industrial Symbiosis Association (EUR-ISA) was launched on 6 November 2013. The 2015 Circular Economy Package highlights industrial symbiosis as an innovative industrial process to support the

transition to a more circular economy.<sup>80</sup> The Roadmap, EREP, EUR-ISA, and the Circular Economy Package all indicate increasing support for industrial symbiosis, as does the EU.<sup>81</sup>

The selected case study is the Kalundborg industrial symbiosis. This is the seminal example of industrial symbiosis, and is also from where the term ‘industrial symbiosis’ originates.<sup>82</sup> This case study has already been much studied in the literature,<sup>83</sup> but it is used in this paper nonetheless as a scoping case study to determine the value of examining the role of legislation, contracts and property rights in waste for industrial symbiosis. We are currently undertaking similar further research within the context of other industrial symbiosis case studies in Linköping (Sweden), Peterborough (the UK) and Rotterdam (the Netherlands).

The Kalundborg industrial symbiosis is located in the municipality of Kalundborg, which is on the north-western coast of the largest Danish island Zealand. It is the largest industrial cluster outside of the Danish capital of Copenhagen. It emerged spontaneously in 1959, and has evolved since then, not according to a plan but spontaneously. It was not until the 1980s that the participants in the industrial symbiosis first recognised the environmental implications of partnerships and exchanges that had evolved. Upon discovery, a network was created. Economic benefits have been the main driver for the spontaneous evolution, but regulation has also played a role as well as communication between the different businesses located in Kalundborg.

The exchanges in the Kalundborg industrial symbiosis are controlled by contracts, governed by the Danish Sale of Goods Act 2014 (Købeloven).<sup>84</sup> These contracts include prices for the exchanges for a set period, payment terms, and mechanisms for future changes (such as escape clauses and requirements for upgrading). Waste is thus currently treated as private property, as there is a right by organisations to exclude others from it.

In this case private property rights are not a barrier to industrial symbiosis. It should, however, be noted that Kalundborg provides an ideal industrial symbiosis operation. It has evolved organically over time and in this case the absent kind of engaged policymaking that Denmark used to exhibit in the first couple of decades that links were initiated is unusual. (This has now changed and having seen and understood benefits of industrial symbiosis they are taking a much more directly involved approach). Replications of Kalundborg have been attempted but unsuccessfully. This is why a CPR approach needs to be considered as it does not necessarily require the privatisation of waste, and can arguably more effectively orient to sustainable development, environmental principles and non-linear (i.e. circular) approaches. Additionally, CPR emphasises the social dimension of treating waste, rather than the property and contractual approaches.

The social dimension of waste is critical because in moving towards away from linear approaches to waste, the shift will need to be partly cultural. As Reich noted, ‘it is culture that makes a diamond valuable and a pebble worthless’.<sup>85</sup> In similar fashion, it is legal culture - the expression of values, ideas and attitudes in law - that makes property valuable and waste worthless.<sup>86</sup> If we accept that in a linear economy approaches to waste might be flawed, not least in their inability to cope with the waste nullius problem, then one of our principal challenges in advocating the transition to a circular economy is identifying the appropriate legal form for waste – namely one which can embrace, account for and deploy unowned or unwanted waste for wider environmental and economic benefits. A Blackstonian reading of waste as private property, albeit culturally embedded in Western legal culture, is argued to lack the transformative power to achieve what we believe is required – namely a conception of property that is capable of envisaging waste as a resource and not merely an asset. That conception must be readily adaptable to the mutuality of circular systems and flexible enough to accommodate the uncertainties present in current regulatory definitions and interpretations of waste and the activities associated with it. A Blackstonian legal conception of property, which is concerned with rights in rem, property belonging to a single individual and the right to exclude other individuals,<sup>87</sup> is suggestive of rigid norms articulating property rights that are, in the modern context, designed to be exercised in support of a well-functioning market aimed at economic growth. That is not, necessarily, what circular economies drive at. As such, it may be argued that a Blackstonian approach to property in waste is too narrowly tailored for our purposes since those traditionally posited and understood facets of the legal ownership of property - exclusion, transfer, alienation – aim

more squarely at wealth maximization<sup>88</sup> than at the preservation, augmentation and recycling of resources undertaken in circular systems. In circular systems, wealth maximization might be a consequence of those activities but is not a reason for them. For this reason, too, and because of its orientation toward single ownership, envisaging property as a ‘bundle of rights’ does not meet our purpose either. <sup>89</sup> The suggestion we make here is that adopting a Lockean perspective on property firstly enables the establishment of waste as a common resource. Secondly, a Lockean perspective helps to resolve a number of difficulties associated with the way in which waste is envisaged by positive law and, thirdly, may provide a more appropriately adapted means of dealing with the concept of waste in circular systems. Due to its contestability, we do not advocate that Locke’s theory of property provides a complete solution to each of the issues identified in this paper.<sup>90</sup> We do suggest that approaching those issues from a Lockean perspective might promote the cultural shift that is necessary to effect the transition towards a circular economy and respect for the environment as societal goods.

Locke’s starting point is that the earth and everything on it has been given ‘to mankind in common’.<sup>91</sup> In that “no body has originally a private dominion, exclusive of the rest of mankind, in any of them, as they are thus in their natural state” there must “of necessity be a means to appropriate them”.<sup>92</sup> The means identified by Locke is a person’s labour. He states that:

every man has a property in his own person;... The labor of his body and the work of his hands, we may say, are properly his. Whatsoever then he removes out of the state that Nature has provided and left it in, he has mixed his labor with, and joined to it something that is his own, and thereby makes it his property.<sup>93</sup>

Locke’s concern here is the original acquisition of property rights from the stock of goods held in common,<sup>94</sup> rather than the transfer or redistribution of existing property. In broad terms, therefore, Locke’s claim is that the application of labour to ‘unowned’ property transforms common property into private property, enabling the acquisition of property and forming a legitimate right to it.<sup>95</sup> The idea of labour is, thus, essential to the establishment of ownership since it is a means of exploiting a resource, adding to its value and, ultimately, taking ownership of it. Clarke and Kohler state that Locke’s requirement of labour ‘provides a justification for giving property rights in newly created things to the creator rather than to anyone else’. <sup>96</sup> This is highly significant since, in the circular economy and industrial symbiosis scenarios, the ‘treatment’ of waste may be seen in exactly this way: the exploitation of an unowned resource for benefit, that benefit being felt across a range from the individual to community, but where property is argued to remain in the creator – the one who treated the waste. This serves the dual purpose of enabling the ‘creator’ to use the waste for her own purposes and placing responsibility on her to treat the waste in accordance with any environmental regulations that may exist. From being unowned and unwanted, the waste has been transformed through labour into property, with its associated benefits and burdens. Naturally, there have been criticisms of the labour theory of property.<sup>97</sup>

As noted by Judge, ‘absent an organizing telos that establishes a social objective, a labor theory of property is prejudiced against awarding rights to those naturally occurring goods, like biodiversity, the ozone layer, or clean air and water, which exist independent of human action’.<sup>98</sup> The point is well taken but need not concern us since, in the industrial symbiosis setting, it is waste that is subjected to labour, rather than anything naturally occurring. Moreover, there is an organising telos which has established the social objective of environmental protection. That objective is expressed in society’s norms governing the treatment, handling and disposal of waste.

Locke’s theory, in embracing both common and individual or private forms of ownership, comports with the idea of the circular system since, as noted by Xu and Allain, it is arguably able to contemplate group access common property or limited access common property where a group of commoners can exclude outsiders but cannot exclude each other within that group. <sup>99</sup> In terms of the internal workings of the closed system, and the distribution of property inside, Locke’s theory maintains that communities, by agreement, will settle the rights to the property that their labour has produced.<sup>100</sup>

Locke’s theory of property has been criticised for its inability to impose constraints on ownership, and for justifying extensive property rights<sup>101</sup> but, in the context of industrial symbiosis, the network

and extent of those rights are naturally bounded by the closed system in which the waste is being 'exploited'. There is, therefore, an inherent, structural limit on the creation of property rights, which may be argued to avoid those dangers.

## 5. Conclusion

In relation to Kalundborg, the Blackstonian absolute private dominion principles are in operation. But this is a context where the value of waste has been recognised, it has been attributed a monetary value and its commodification has worked with the trading model being used. It has however not generated a model which has been adopted in a widespread fashion. In other contexts, the notion of waste as a burden is the dominant perception and the encouragement of new approaches to resolve the problem of waste need to be addressed. Using communal property approaches where the community takes control of waste and forces the usage of waste through CPR mechanisms where management protocols are adopted seems to be a way forward.

## References

1. Blackstone described property as "that sole and despotic dominion which one man claims and exercises over the external things of the world, in total exclusion of the right of any other individual in the universe" – William Blackstone, II Commentaries on the Laws of England (Clarendon Press 1765-1769) Chp 1, 2. Note that this is only a short quotation from a much longer text, and therefore it can be quoted out of context: Frederick G Whelan, 'Property as Artifice: Hume and Blackstone' in J Roland Pennock and John W Chapman (eds) *Nomos XXII: Property* 1010 (1980) 118; Alison Clarke and Paul Kohler, *Property Law: Commentary and Materials* (Cambridge University Press 2005) 183.
2. In 2014 (the most recent year for which EU statistics on waste exist), the highest amount of waste was recorded for the EU-28 since the beginning of the recorded data (2004). Note that there are considerable variations between amounts of waste generation between Member States and activities. For example, in 2014 Croatia produced around 723kg of waste excluding major mineral wastes per inhabitant, while Estonia produced 9.5 tonnes of such waste per inhabitant. Eurostat, 'Waste Statistics' (December 2016) <[http://ec.europa.eu/eurostat/statistics-explained/index.php/Waste\\_statistics](http://ec.europa.eu/eurostat/statistics-explained/index.php/Waste_statistics)> accessed 9 January 2017.
3. In 2014 (the most recent year for which EU statistics on waste exist), the highest amount of waste was recorded for the EU-28 since the beginning of the recorded data (2004). Note that there are considerable variations between amounts of waste generation between Member States and activities. For example, in 2014 Croatia produced around 723kg of waste excluding major mineral wastes per inhabitant, while Estonia produced 9.5 tonnes of such waste per inhabitant. Eurostat, 'Waste Statistics' (December 2016) <[http://ec.europa.eu/eurostat/statistics-explained/index.php/Waste\\_statistics](http://ec.europa.eu/eurostat/statistics-explained/index.php/Waste_statistics)> accessed 9 January 2017.
4. Ibid.
5. Ibid.
6. The three pillars of sustainable development, economic development, social development and environmental protection, were acknowledged in the Johannesburg Declaration on Sustainable Development (4 September 2002) UN Doc A/CONF.199/20 (1992) as 'independent and mutually reinforcing pillars of sustainable development'. For a more detailed discussion of the three pillars, see: Adress Ross, *Is the Environment Getting Squeezed out of Sustainable Development?* [2003] Public Law 249.
7. See for example: Kenneth Westlake, *Landfill Waste Pollution and Control* (Woodhead Publishing 1995); Kenneth L Mulholland and James a Dyer, *Pollution Prevention: Methodology, Technologies and Practices* (American Institute of Chemical Engineers 1999); Marquita K Hill, *Understanding Environmental Pollution* (3rd edn, Cambridge University Press 2010).
8. See for example: William P Cunningham and Barbara Woodworth Saigo, *Environmental Science: A Global Concern* (WCB/McGraw-Hill 1999) 518; Raquel Pinderhughes, *Planning for Sustainable Development in Cities throughout the World* (Rowman & Littlefield Publishers 2004) 63; John and Sharon McEldowney, *Environmental Law* (Pearson 2010) 217.
9. See for example: Bernt Johnke and others, 'Emissions from Waste Incineration' in J Penman and others (eds) *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (Institution of Global Environmental Strategies on behalf of the Intergovernmental Panel on Climate Change 2000) 455; Giorgio Buonanno and Lidia Morawska, 'Ultrafine Particle Emission of Waste Incinerators and Comparison to the Exposure of Urban Citizens' (2015) 37 *Waste Management* 75.
10. European Commission, 'Being Wise with Waste: the EU's Approach to Waste Management' (2010) 7 <<http://ec.europa.eu/environment/waste/pdf/WASTE%20BROCHURE.pdf>> accessed 22 November 2016.
11. WWF, 'Living Planet Report 2014: Species and Spaces, People and Places' (2014) <http://bit.ly/1sxx5mi> accessed 10 November 2014, 33.
12. Commission, 'Taking Sustainable Use of Resources Forward: A Thematic Strategy on the Prevention and Recycling of Waste' (Communication) COM (2005) 666 final 3.
13. See for example: Integrated Product Policy (Commission, 'Integrated Product Policy: Building on Environmental Life-cycle Thinking' (Communication) COM (2003) 302 final.); Circular Economy Package (Commission, 'Closing the Loop – An EU Action Plan for the Circular Economy' (Communication) COM (2015) 614 final).
14. For example, the value of the UK market for the 'he collection, treatment, recycling and disposal of controlled waste was an estimated £18.9 billion in 2013, with this estimated to increase to £24bn following annual growth rates of between 3-7% per annum by 2018. Waste Management Market Report UK 2014-2018 Analysis, (AMA Research Ltd, Cheltenham, UK). Summary of contents available here: [http://www.amaresearch.co.uk/waste\\_management\\_14s.html](http://www.amaresearch.co.uk/waste_management_14s.html) accessed 19 November 2016.
15. Even where waste is a resource, there is still some production of waste, such as heat, as a result of physics (thermodynamics).
16. Harold Demsetz, 'Information and Efficiency: Another Viewpoint' (1969) *Journal of Law & Economics*, 12: 1–22.
17. Ronald H Coase, 'The Problem of Social Cost' (1960) 3(1) *Journal of Law and Economics* 837, 850-851.
18. Garrett Hardin, 'The Tragedy of the Commons' (1968) 162(3859) *Science* 1243. In this article Hardin referred to the 'tragedy of the commons'. This was revised in 1981 to 'unmanaged commons' following criticism. Garrett Hardin, 'An Ecolate View of the Human Predicament' (1981) 7(2) *Alternatives: Global, Local, Political* 242, 243.
19. Hardin, 'The Tragedy of the Commons' (n 18) 1245. For discussions of the tragedy and Coase theorem, see for example: Gary D Libecap, 'The Tragedy of the Commons: Property Rights and Markets as Solutions to Resource and Environmental Problems' (2009) 53(1) *Agricultural and Resource Economics* 129, 129-130; Brett Frischmann, 'Two Enduring Lessons from Elinor Ostrom' (2013) 9(4) *Journal of Institutional Economics* 387, 389.
20. Hardin, 'The Tragedy of the Commons' (n 18) 1245.

21. See for example: Siegfried V Ciriacy-Wantrup and Richard C Bishop, "'Common Property" as a Concept in Natural Resource Policy' (1975) 15 *Natural Resources Journal* 713, 714; Bonnie McCay and James Acheson, 'Human Ecology of the Commons' in Bonnie McCay and James Acheson (eds), *The Question of the Commons: Culture and Ecology of Communal Resources* (The University of Arizona Press 1987); Charlotte Hess and Elinor Ostrom, 'An Overview of the Knowledge Commons' in Charlotte Hess and Elinor Ostrom (eds), *Understanding Knowledge as a Commons: From Theory to Practice* (The MIT Press 2007) 30-32; Fikret Berkes, David Feeny, Bonnie McCay and James Acheson, 'The Benefits of the Commons' (1989) 340 *Nature* 91, 92.
22. Jean-Marie Baland and Jean-Philippe Platteau, 'Should Common Property Resources be Privatized? A Re-examination of the Tragedy of the Commons' (Development, Center for Research in Economic Development, Namur University) Discussion Paper No 143, 21.
23. Richard Cornes and Todd Sandler, *The Theory of Externalities, Public Goods and Club Goods* (2nd edn, Cambridge University Press 1996) 43.
24. Francis Lieber, *Legal and Political Hermeneutics* (CC Little and J Brown 1838) 303; James B Thayer, *A Preliminary Treatise on Evidence* (Little Brown and company 1898) 190; and Ezra R Thayer, *Legal Essays* (Boston Book 1908) 220.
25. Ilona Cheyne and Michael Purdue, 'Fitting Definition to Purpose: the Search for a Satisfactory Definition of Waste' (1995) 7(2) *JEL* 149, 149. See also: John Thomas Smith II, 'The Challenges of Environmentally Sound and Efficient Regulation of Waste – the Need for Enhanced International Understanding' (1993) 5(1) *Journal of Environmental Law* 91, 107. Smith states that an understanding of the definition issues is 'a prerequisite to the design and implementation of sensible and compatible national and international waste management requirements'.
26. Joseph Raz, 'The Rule of Law and its Virtue' (1977) 93 *LQR* 195, 198-9.
27. Stephen Tromans, 'EC Waste Law - a Complete Mess?' (2001) 13 *Journal of Environmental Law* 133, 140.
28. Council Directive 2008/98/EC of 19 June November 2008 on waste and repealing certain Directives [2008] OJ L312/3 (WFD). This is the second revision since the WFD's first implementation in 1975. First revision of the WFD: Council Directive 75/442/EC of 15 July 1975 on waste [1975] OJ L194/39 as amended by Council Directive 91/156/EEC of 18 March 1991 on waste [1991] OJ L78/32. Second revision of the WFD: Council Directive 2006/12/EC of 5 April 2006 on waste [2006] OJ L114/9.
29. WFD, art 1.
30. Maria Lee, *EU Environmental Law: Challenges, Change and Decision-making* (Hart Publishing 2005) 216. Some of the more discussed case law on the definition of waste include: Joined Cases 206/88 and 207/88 *Vessoso and Zanetti* [1990] ECR I-1461; Case C-304/94 *Euro Tombesi and Others* [1997] ECR I-3561; Joined Cases C-418/97 and C-419/97 *ARCO Chemie Nederland Ltd v Minister van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, Vereniging Dorpsbelang Hees and Others v Directeur van de dienst Milieu en Water van de provincie Gelderland* [2000] ECR I-4475; Case C-9/00 *Palin Granit and Vehmassalon kansanterveysystön kuntayhtymän hallitus* [2002] ECR I-3533; Case C-444/00 *Mayer Parry Recycling Ltd and Environmental Agency, Secretary of State for the Environment, Transport and the Regions* [2003] ECR I-6163; Case C-235/02 *Saetti and Frediani* [2004] ECR I-1005; Case C-457/02 *Niselli* [2004] ECR I-10875.
31. Commission, 'Guidance on the Interpretation of Key Provisions of Directive 2008/98/EC on Waste' <<http://ec.europa.eu/environment/waste/framework/pdf/guidancedoc.pdf>> accessed 10 August 2014.
32. Ludwig Krämer, 'The Distinction between Product and Waste in Community Law' (2003) 11(1) *Environmental Liability* 3, 7. Chalmers believes that there is 'no real reason' for the meaning of these two terms to be 'substantially different' – Damien Chalmers, 'Community Policy on Waste Management - Managing Environmental Decline Gently' (1995) 15(1) *Yearbook of European Law* 257261.
33. *Saetti and Frediani* (n 30) para 3; *Palin Granit* (n 30) paras 22, 27 and 29.
34. *Vessoso and Zanetti* (n 30) para 11. Damien Chalmers, 'Community Policy on Waste Management - Managing Environmental Decline Gently' (1995) 15(1) *Yearbook of European Law* 257, 262.
35. *ARCO Chemie* (n 30).
36. *Euro Tombesi* (n 30).
37. *Palin Granit* (n 33).
38. Krämer (n 32) 9.
39. *Ibid* 10.
40. *Ibid* 11.
41. Rosalind Malcolm and Roland Clift, 'Barriers to Industrial Ecology: The Strange Case of "the Tombesi Bypass"' (2002) 6(1) *Journal of Industrial Ecology* 4, 6.
42. Krämer (n 32) 9; David Pocklington, 'Opening Pandora's Box – the EU Review of the Definition of "Waste"' (2003) 12(7) *European Environmental Law Review* 204, 215. See also: Stuart Bell, 'Refining the Definition of Waste' (1999) 1 *Environmental Law Review* 283, 295.
43. Clarke and Kohler, (n 1).
44. Hohfeld (n 47).
45. *Ibid* 30.
46. *Ibid*.
47. W N Hohfeld, 'Some Fundamental Legal Conceptions as Applied in Judicial Reasoning' (1913) 23 *Yale Law Journal* 16, 16.
48. Eva Prongrácz and Veikko J Pohjola, 'Re-defining Waste, the Concept of Ownership and the Role of Waste Management' (2004) 40 *Resources, Conservation and Recycling* 141, 145.
49. Thomas Merrill, 'Property and the Right to Exclude' (1998) 77 *Nebraska Law Review* 730, 730-731.
50. For analysis of the literature see F. von Benda-Beckmann et al, 'The Properties of Property' in: F. von Benda-Beckmann/K. von Benda-Beckmann/M. G. Wiber (eds), *Changing Properties of Property*, New York: Berghahn Books, 2006, Ch. 1 and J.W. Hamilton/N. Banks, 'Different Views of the Cathedral: The Literature on Property Law Theory' in: A. McHarg et al, (eds), *Property and the Law in Energy and Natural Resources*, Oxford: Oxford University Press, 2000, Ch. 2; also (from a law and economics perspective) B. Yandle/A. P. Moriss, 'The Technologies of Property Rights: Choice among Alternative Solutions to Tragedies of the Commons' (2001) 28 *Ecology Law Quarterly* 123 at 129 and (in the context of common pool resources) E. Schlager/E. Ostrom, 'Property-Rights Regimes and Natural Resources: A Conceptual Analysis', 68 *Land Economics* 1992, pp. 249-262. For a discussion of property rights in water, see: Alison Clarke and Rosalind Malcolm, 'The Role of Property in Water Regulation: Locating Communal and Regulatory Property Rights on the Property Rights Spectrum' in Christine Godt (ed), *Regulatory Property Rights: The Transforming Notion of Property in Transnational Business Regulation* (Brill Nijhoff 2016) 121 -140, and Rosalind Malcolm and Alison Clarke, 'Water: A Common Treasury', in T Xu and A Clarke (eds) *Legal Strategies for the Development and Protection of Communal Property Proceedings of the British Academy*, Oxford: Oxford University Press, 2017 (forthcoming).
51. Clarke and Malcolm (n 50) 121 -140.
52. In Kalundborg there are incentives, but maybe need national level intervention here to get local authorities to seek out and implement circular systems.
53. Thomas Lindhqvist, 'Extended Producer Responsibility in Cleaner Production: Policy Principle to Promote Environmental Improvements of Product Systems' (Doctoral dissertation, Lund University 2000) 29.
54. WFD, preamble, recital 27.
55. WFD, art 8(1).
56. An amendment to the WFD has been proposed to introduce a definition for EPR in Article 8(1): EPR 'means the producer's operational and/or financial responsibility for a product extended to the post-consumer state of a product's life cycle'. Commission, 'Proposal for a Directive of the European Parliament and of the Council amending Directives 2008/98/EC on waste, 94/62/EC on packaging and packaging waste, 1999/31/EC on the landfill of waste, 2000/53/EC on end-of-life vehicles, 2006/66/EC on batteries and accumulators and waste batteries and accumulators, and 2012/19/EU on waste electrical and electronic equipment' COM (2014) 397 final.

57. R J Lifset, 'Take it Back: Extended Producer Responsibility as a Form of Incentive-based Environmental Policy' (1993) 21(4) *Resource Management and Technology* 163; G Ji and others, 'Constructing Sustainable Supply Chain under Double Environmental Medium Regulations' (2014) 147 *International Journal of Production Economics* 211.
58. Elinor Ostrom, *Understanding Institutional Diversity* (Princeton University Press 2005) 23.
59. Elinor Ostrom, Larry Schroeder and Susan Wynne *Institutional Incentives and Sustainable Development: Infrastructure Policies in Perspective* (Westview Press 1993) 81; Brett Frischmann, *Infrastructure: The Social Value of Shared Resources* (Oxford University Press 2012) 26.
60. See for example: Mancur Olson, *The Logic of Collective Action: Public Goods and the Theory of Groups* (Harvard University Press 1965) 14; Ostrom (n 58) 24.
61. Elinor Ostrom, 'Property-Rights Regimes and Common Goods: A Complex Link' in Adrienne Héritier (ed), *Common Goods: Reinventing European and International Governance* (Rowman & Littlefield Publishers 2002) 39.
62. See for example: William Blomquist and Elinor Ostrom, 'Institutional Capacity and the Resolution of a Commons Dilemma' (1985) 5(2) *Policy Studies Review* 383, 383; Elinor Ostrom, 'Reformulating the Commons' in Joanna Burgur and others (eds), *Protecting the Commons: A Framework for Resource Management in the Americas* (Island Press 2001) 15; Ostrom, 'Property-Rights Regimes and Common Goods: A Complex Link' (n 57) 39.
63. Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge University Press 1990) 30.
64. Olli Salmi and others, 'Governing the Interplay between Industrial Ecosystems and Environmental Regulation' (2012) 16(1) *Journal of Industrial Ecology* 119. Note that Salmi and others refer to the materials exchanged within the industrial symbiosis as by-products rather than waste.
65. Jérémie Cavé, 'A Political Economy of Urban Solid Waste Management in Emerging Countries: Learning from Vitória (Brazil) and Coimbatore (India)' in Olivier Coutard and Jonathan Rutherford (eds), *Beyond the Networked City: Infrastructure Reconfigurations and Urban Change in the North and South* (Routledge 2016) 173.
66. Ibid 174.
67. Elli Louka, *International Environmental Law: Fairness, Effectiveness, and World Order* (Cambridge University Press 2006) 77-78; Patricia Park, *International Law for Energy and the Environment* (2nd edn, CRC Press 2013) 4.
68. Elinor Ostrom, 'Reformulating the Commons' in Joanna Burgur and others (eds), *Protecting the Commons: A Framework for Resource Management in the Americas* (Island Press 2001) 18.
69. Salmi and others (n 64).
70. Frank Schiller, Alexandra Penn, and Lauren Basson, 'Analyzing Networks in Industrial Ecology - a Review of Social-Material Network Analyses' (2014) 76(1) *Journal of Cleaner Production* 1.
71. D Rachel Lombardi and others, 'Industrial Symbiosis: Testing the Boundaries and Advancing Knowledge' (2012) 16(1) *Journal of Industrial Ecology* 5, 5.
72. Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge University Press 1990).
73. See for example: Knight, Peter, 'A Rebirth of the Pioneering Spirit' *Financial Times* (London, 14 November 1990); Jørgen Christensen, 'The Kalundborg Symbiosis: What, Who, When, How and Why?' (University of Surrey, 28 March 2012) <[https://www.surrey.ac.uk/ces/files/Jorgen\\_Christensen\\_Presentation.pdf](https://www.surrey.ac.uk/ces/files/Jorgen_Christensen_Presentation.pdf)> accessed 18 May 2015.
74. Commission, 'Roadmap to a Resource Efficient Europe' (Communication) COM (2011) 571 final.
75. Commission, 'European Resource Efficiency Platform' (Manifesto and Policy Recommendations 2012) <[http://ec.europa.eu/environment/resource\\_efficiency/documents/erep\\_manifesto\\_and\\_policy\\_recommendation\\_s\\_31-03-2014.pdf](http://ec.europa.eu/environment/resource_efficiency/documents/erep_manifesto_and_policy_recommendation_s_31-03-2014.pdf)> accessed 21 November 2014 (EREP).
76. Circular Economy Package (n 10).
77. Commission, 'Roadmap to a Resource Efficient Europe' (Communication) COM (2011) 571 final 6-7.
78. EREP (n 60) 7.
79. Ibid 8.
80. Circular Economy Package (n 10) 5.
81. Industrial symbiosis has also further received support at EU level through a recent funding call for research into industrial symbiosis as a strategy in moving towards a circular economy - Commission, 'Waste: A Resource to Recycle, Reuse and Recover Raw Materials' (11 December 2013) <<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2111-waste-1-2014.html>> accessed 17 July 2014.
82. See for example: Henning Grann, 'The Industrial Symbiosis at Kalundborg' in Deanna J Richards (ed), *The Industrial Green Game: Implications for Environmental Design and Management* (National Academies Press 1997) 117.
83. For example, a search on journal articles discussing 'Kalundborg' in the *Journal of Industrial Ecology* alone already yielded more than 100 results in March 2017.
84. Bekendtgørelse af lov om køb. LBK nr 140 af 17/02/2014.
85. Charles Reich 'The New Property' (1964) 73(5) *Yale Law Journal* 733, 739.
86. We acknowledge that this definition of culture is sociological and that 'culture' is a contested concept. See, for example, Roger Cotterrell, *Law, Culture and Society: Legal Ideas in the Mirror of Social Theory* (Ashgate 2013); Pierre Legrand and Roderick Munday, Roderick (eds.) *Comparative Legal Studies: Traditions and Transitions* (Cambridge University Press 2003); David Nelken 'Using the Concept of Legal Culture' (2004) 29 *Australian Journal of Legal Philosophy* 1.
87. Abraham Bell and Gideon Parchomovsky, 'A Theory of Property' (2005) 90 *Cornell Law Review* 531, 543-544. See also n 1.
88. Ting Xu and Jean Allain, *Property and Human Rights in a Global Context* (Haywards Heath, Hart Publishing 2016) 4-5.
89. See H Demsetz 'Toward a Theory of Property Rights' (1967) 57(2) *The American Economic Review* 347; A Bell and G Parchomovsky, 'Reconfiguring Property in Three Dimensions' (2008) 75 *University of Chicago Law Review* 1015.
90. See, for example, J Waldron, 'Enough and as Good Left for Others' (1979) 29 (117) *Philosophical Quarterly* 319; 'Locke, Tully and the Regulation of Property' (1984) 32(1) *Political Studies* 98; R Nozick, *Anarchy State and Utopia* (New York, Basic Books) 1974; R Arneson, 'Lockean Self-Ownership: Towards a Demolition' (1991) 39 *Political Studies* 36; R Ashcraft, *Revolutionary Politics and Locke's Two Treatises of Government* (Princeton University Press 1986); G Sreenivasan, *The Limits of Lockean Rights in Property* (Oxford University Press 1995). For an overview of the principal critiques of Locke see K Widerquist 'Lockean Theories of Property: Justifications for Unilateral Appropriation' (2010) 2(1) *Public Reason* 3.
91. John Locke, *Second Treatise of Government* (Macpherson CB ed, Hackett Publishing Company, Inc 1980) Chapter 5 'On Property', section 25.
92. Ibid section 26.
93. Ibid section 27.
94. R P Judge, 'Restoring the Commons: Toward a New Interpretation of Locke's Theory of Property' (2002) 78(3) *Land Economics* 331.
95. Locke (n 91) section 45.
96. Clarke and Kohler (n 1) 91.
97. A J Simmons, *The Lockean Theory of Rights* (Princeton 1992) 268.
98. Judge (n 94) 334.
99. Xu and Allain (n 88) 8-9.
100. Ibid.
101. H Howe, 'Lockean Natural Rights and the Stewardship Model of Property' (2013) 3 *Prop L Rev* 36.

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# Financial Statement Fraud Control: Audit Testing and Internal Auditing Expectation Gap

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**Abstract.** This research aims to make recommendations to improve financial statement fraud control in the context of auditing financial statements in commercial companies. The two case study companies were examined and the information gleaned from interviews used to understand the roles and responsibilities of the internal and external auditors. The research found a gap in the perceived responsibility of financial statement fraud detection and control. Therefore, the research further examined the issue of audit testing in relation to financial statement fraud detection and control. The findings suggest that internal auditing of financial statements is a complementary method to strengthen financial statement fraud control. The research contributes to the study of financial statement fraud control and provides practical recommendations for financial statement auditing theory. The research focuses on the contribution gained from the PhD thesis entitled „financial statement fraud control: Experience in Malaysia commercial companies“.

**Keywords:** Financial Statement; Fraud; Internal Auditor.

## 1. Introduction

The 12th Global Fraud Survey (Ernst & Young, 2011) revealed that fraud remained one of the most problematic issues for businesses worldwide. Globally, the number of companies reporting fraud increased by 22% since 2003 (PwC, 2007). Financial statement fraud in particular is a major risk to businesses and can completely drain the long-term success of the business. Consequently, the level of financial statement fraud should be controlled and reduced among the corporations world-wide. Businesses have taken all measures and controls to ensure security and truthful acts. However, unfortunately, these have failed to raise the necessary ‘red flags’. The question now is what else needs to be done to fight fraud cases? It seems that the actions taken by the authorities in the aftermath of fraud cases are insufficient to stop another fraud case from happening. It is now timely to address whether the deterrence strategies put in place by industry are adequate in today’s business environment. In accordance with the above scenario, it is anticipated that the results of this research will identify ways to reduce financial statement fraud, and, accordingly the research will make recommendations to improve financial statement fraud control in commercial companies.

## 2. Financial Statement Fraud and Controls

Financial statements or financial reports are considered as tools upon which users can rely when making investment decisions. Hence, financial statements should be free from any misleading information, and must be of high quality and reliable in order to safeguard the interests of shareholders, investors, etc. However, in reality, the reliability of financial statement information seems to be questioned by both investors and the public. As a matter of fact, the reliability of information provided by financial statements remains one of the most problematic issues for businesses worldwide (PWC 2007). In general, Summers (2008) documents that fraud is a massive and growing problem. According to a UK Study of fraud and financial risk Management 2009, two thirds of businesses perceived fraud to be a risk in their industry; however, less than one third of



businesses had a fraud awareness programme or any educational programme relating to the threat of fraud. The issue is serious as the actual level of economic crime and the associated financial and non-financial damages have been reported to be on the rise (PWC 2007), and the number of financial statement fraud cases has increased since 2003 (PWC 2007). The impact is that companies suffered significant ‘collateral damage’, such as loss of reputation, decreased staff motivation and declining business relations (PWC 2005). The question is what is lacking in the internal control system adopted by the companies?

### 3. Literature Review

The research has identified that the issue of financial statement fraud has become a focus of the public, investors, regulators and practitioners due to the huge losses resulting from the reported fraud worldwide. In the US, 2,494 cases involving financial crime were investigated by the Federal Bureau of Investigation (2009). The present research has viewed financial statement fraud from the perspective of both the legislation and academic literature. According to the Fraud Act 2006, one element of financial statement fraud is that “a person is guilty of fraud if he is in breach of any sections listed in subsections (2), which includes (2a) false by representation, (2b) fraud by failing to disclose information, and (2c) fraud by abuse of position”. The Theft Act 1968 defines false accounting as “where a person dishonestly with a view to gain for himself or another or with intent to cause loss to another which includes (1) destroys, (2) defaces, conceals or falsifies any accounts or any record or document made or required for accounting purposes; or (2) in furnishing information it is found to be misleading, false or deceptive and cause losses to another”.

From an academic perspective, Grazioli, et al (2006) defines financial statement fraud as an intentional process of deception by the company management. Another definition of financial statement fraud, provided by NCFRR (1987), argues that it is reckless conduct by act or omission that results in materially misleading financial statements. However, KPMG (2005) explains that financial statement fraud occurs when financial records have been falsified or manipulated or altered. Therefore, the disclosures will definitely be false. Razaee (2002) further identifies the two different ways that a company may commit financial statement fraud, that is by misapplication and interpretation of accounting standard or manipulating the accounting practices. Although there are a number of motives for financial statement fraud, the most common motives arise due to the weak financial conditions of companies. Reinstein et al. (2006) document that financial statement fraud begins with financial and morale problems in the company, in which the company’s control environment is lacking which encourages inefficiency within its auditing procedures. These findings were supported by Carcello and Palmrose (1994), Dechow et al. (1996) and Lys and Watts (1994) who found that financial distress and poor financial performances are the most important reason for financial statement fraud occurrences. Therefore, the companies have a propensity to mislead in terms of their financial information and the probability of financial statement fraud is raised.

According to the auditing standard, SAS 99, auditors and management have the ultimate responsibility for establishing controls and procedures to protect the organization’s assets. The most important elements consist of (1) creating and maintaining a culture of honesty and high ethics among the employees, (2) evaluating the risk of fraud, and implementing risk mitigation in relation to the financial statement and (3) developing an appropriate oversight process by internal and external parties towards financial statement fraud. The US government enacted the Sarbanes Oxley Act 2002 to address the monitoring mechanisms to control financial statement fraud by improving the company’s corporate governance, enhancing the accountability and the transparency of financial statements (Razaee, 2002). The enactment of SOX 2002 is expected to improve independence, objectivity, and effectiveness of audit committee. The research by Chen et al. (2006) suggests that a large number of outside directors would contribute to control financial statement fraud in the company. The large proportion of outside directors would be helpful in monitoring the firm’s activity and deterring company fraud. Specifically, Beasley (1996) refers to the outside directors as all nonemployee directors. He suggests that the longer the tenure of the directors in the company the better would be the control and mitigation of financial statement fraud. Dechow et al. (1996) add that

directors or chairman with shorter tenure have less company experience and, therefore, are unable to deter fraud in the company. The board of directors is possibly the highest internal control mechanism for monitoring the actions of top management. In addition, an effective internal control structure and audit functions are found to be important in controlling financial statement fraud. NCIR (1987) documents the management responsibilities to design adequate and effective internal controls in the financial statement process. In reality, internal auditors of the company have to promote or encourage the management to develop a detailed fraud prevention programme (Carpenter and Mahoney, 2001). Kang (2001) suggests that more frequent meetings of the audit committee, at least five times a year, would enhance the monitoring process of the effectiveness of the company's internal control. Zhang et al. (2007) state that the effective role of the audit committee contributes to better internal control of the company. In addition to the competency of the audit committee, they are also expected to be independent in overseeing the company's internal control. The audit committee is also responsible for ensuring that management does not engage in fraudulent conduct.

Altanmuro and Beatty (2010) found that internal control is significant in producing a quality financial statement and preventing financial statement fraud. The Committee of Sponsoring Organizations of the Treadway Commission (COSO) 1992 defined internal control as a process system that affected every level of individual in the organization. The purpose of the designed internal control is to provide reasonable assurance concerning the (1) business operation and (2) issued financial statements. KPMG (1999) states that the responsibilities of company directors is to provide an effective system of the internal control in organizations. In the meantime, Fadzil et al. (2005) found that the professional proficiency of internal auditors influences the effectiveness of the internal audit function. Therefore, the scope of internal audit work has an effect on the risk assessment aspect of the company's internal control system. The conventional duties of internal audit functions include the assurance of the compliance of the operating policies and procedures with those determined by the company management as well as with the laws and regulations.' In addition to these duties, the internal audit function has the responsibility for reviewing the completed financial statement, thereby giving assurance concerning the reliability of the financial reporting (Schleifer and Greenawalt, 1996). However, the Statement on Internal Auditing Standard No 3 added the new roles of the internal auditor to emphasize fraud deterrence and investigation. In relation to this, Flesher (1996) suggests that the internal auditor should consider the indicators of fraud, identify the possibility of fraud in business operations and evaluate the control environment and reporting of the recognized fraud to the audit committee. According to Ratcliffe and Landes (2009), the internal control over financial reporting is aimed at producing reliable financial reporting. Reliable financial reporting has been defined as having (1) encountered the financial reporting objectives, (2) involved the applicable financial reporting framework, and (3) complied with the laws and regulations. The research further states that reliable financial reporting should be guarded by stricter control on financial statement information in relation to the recognition, measurement, presentation and disclosure.

The responsibility of company management is to design a programme for fraud prevention and detection. However, the internal auditors need to play their role in ensuring compliance with such controls. The IIA's Practice Advisory 1210.A2 explains that "internal auditors are responsible for assisting in the deterrence of fraud by examining and evaluating the adequacy and effectiveness of the system of internal control, commensurate with the extent of the potential risk exposure in the various segments of the organization's operation". Ebaid (2011) indicates that the internal audit function in public listed companies is actually based on conventional functions rather than adding value for good company governance. In relation to this, internal auditors are called upon to be more rigorous and possibly enhance the value of good conduct. Hillison et al. (1999) add that the role of internal auditor is to prevent, deter and detect fraud in an organization instead of independent auditors, and Schleifer and Greenawalt (1996) emphasise the critical thinking skills required in internal auditing work. Three key factors are considered important for fraud prevention and detection. These include internal control, risk assessment and management process. These reflect the accountability of the internal auditors and improvement in the internal audit process in respect of overall governance process

(Leung, Cooper and Perera, 2011). In tailoring the position of the internal auditor as the company's watchdog, Soh and Benni (2011) also suggest a new expansion and refocus of the role and the effectiveness of internal auditors in meeting the stakeholders' expectations.

#### **4. Data and Research Methodology**

The methodology of the research has been guided by case studies. The case studies methodology is aimed at understanding the phenomenon in which the data can be collected through various research techniques, namely, interviews and document observation. Therefore, the findings are a mixture of description and analysis that resulted in the identification factors. However, the analysis does not encompass the theory building in grounded theory studies. As such, multiple case study research methods have been conducted, which are supported by interviews with five selected groups of respondents. Therefore, both methods focus on (1) companies' experience and practices and (2) interviewees' perceptions, beliefs, experience and action activities.

#### **5. Results, Discussion and Analysis**

Internal control has been considered as the most important mechanism for ensuring proper adherence to the company's policies, procedures, standards and regulations. In addition, to achieve efficient and effective operations, adherence to internal controls is assumed to protect the companies from any misconduct, wrongdoings or, in particular, financial statement fraud. The case study companies have placed sufficient internal controls across the companies. However, in relation to the financial statement process, the internal controls of both case study companies only focus on adherence to the policies and procedures and compliance with the rules and regulations. The case study findings support the non-auditing financial statement by the internal auditors of the case study companies. The internal auditors of the case study companies have not given any assurance on the financial statement process and financial information. The internal auditor of the case study companies should be the first filterer or gate keeper of financial statement fraud in the companies before it has been audited by the external auditors. The findings of the case study companies have shown that a lack of accounting expertise among the internal auditors is the main reason for their not auditing the financial statement. The role of the internal auditor is presumably significant in ensuring the company has been equipped with financial statement fraud mitigation controls.

##### *5.1. The Financial Statement Fraud Detection and Control Responsibility*

The case study companies have fully relied on the designed internal control as financial statement fraud prevention. However, the assurance of financial statement control has not been relevant to the scope of internal auditing, which covers the adherence of the company's internal control and the compliance of the rules and regulations. In contrast, the research findings have shown the perception of the internal auditors of the case study companies to external auditors' responsibility to detect any fraud during the external auditing works. This indicates the existence of an internal auditing gap among the internal auditor, external auditor and the management of the company in relation to financial statement fraud control and deterrence.

##### *5.2. The Internal Auditing Expectation Gap*

The research identified the presence of the internal auditing gap when company management has fully relied on the internal control system to prevent financial statement fraud. However, the scope of internal auditing work is not relevant to the accuracy of the final published financial statement. In addition, the internal auditors of the case study companies perceive that the external auditor's responsibilities include the detection of financial statement fraud. In contrast, the external auditors perceive that the responsibilities of the internal auditor include detecting financial statement fraud.

The concept of an internal auditing expectation gap is supported by the present duties of the internal auditors in the two case study companies. Presently, the internal auditors have the responsibility to audit the operating procedures, standards and regulation compliances in relation to the financial statement process. However, the detailed checking of the financial transactions and financial statement fraud controls has not been included in the present duties of the internal auditors.

The research found that the present duties of internal auditors of both case study companies focus on control testing of compliance with operating procedures. A control test is intended to verify that the present control of the financial statement process is operated and complied with. However, a control test is not relevant in providing assurance of financial statement accuracy. Therefore, the research found that the substantive internal auditing test in relation to financial information is an unmet expectation of the internal auditor's present duties. The role of the internal auditor is found to be significant to control financial statement fraud in companies and the substantive test on financial information is required in order to reduce the internal auditing expectation gap. Substantive testing within the internal auditing process is recommended to enhance the accuracy of the accounting records. This involves the detailed testing of the transaction and account balances and analytical procedures.

Aligned with the International Standard of Internal Auditing, the reliability and integrity of financial results would be best achieved by the internal auditing process. Even though the role of the internal auditor is not primarily to detect any fraud in the financial statement, it involves ensuring the reliability and the integrity of the financial statement. Another assurance of financial statement fraud control was reviewed by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). The COSO defined the internal control as „a process, affected by an entity's board of directors, management and other personnel, designed to provide reasonable assurance regarding achievement of effectiveness and efficiency of operations, reliable financial reporting and compliance with the applicable laws and regulations“. The phrase of providing the “reasonable assurance of reliable financial reporting and compliance with the applicable laws and regulations” is highly pertinent to this research. Two issues of concern were found, namely, reliable financial reporting, and, secondly, compliance with the laws and regulations. The assurance of reliable financial reporting might not be achieved without the substantive testing of internal financial statement auditing.

## 6. Conclusion

The research has made recommendations to improve financial statement fraud control in commercial companies. The new findings of the research would assist commercial companies, in particular, the public companies in reducing financial statement fraud cases. Internal auditing of the financial statement is found to be the most important control in reducing the internal auditing expectation gap. The research found that in-depth control of financial information through a substantive audit test is required to reduce the internal audit expectation gap, and, therefore, increase the mitigation efforts of financial statement fraud in commercial companies.

## References

- Altamuro, J. L., Beatty, A. L. (2010) How does internal control affect financial reporting? *Journal of accounting and Economics*, 49, 58-74
- Beasley, M. S. (1996) An empirical analysis of the relation between the board of director composition and financial statement fraud, *The Accounting Review*, 71(4), 443-465
- Carcello, J.V. and Palmrose, Z.V. (1994) Auditor Litigation and modified reporting on bankrupt client, *Journal of Accounting Research*, 32, 1-30
- Carpenter, B.W. and Mahoney, D.P. (2001) Analyzing organizational fraud, *Internal Auditor*, April, 33-38.
- Chen, G., Fifth, M., Gao, D.N., and Rui, O.M (2006). Ownership structure, corporate governance and fraud: Evidence from China, *Journal of Corporate Finance*, 12(3), 424-448.
- Committee of Sponsoring Organizations of the Treadway Commission (COSO) (1992), *Internal Control-Integrated framework*
- Dechow, P.M., Sloan, R.G., and Sweeney, A.P. (1996) Causes and consequences of earnings manipulation: An analysis of firms subject to enforcement actions by the SEC. *Contemporary Accounting Research*, 13(1), 1-36.
- Ebaid, I.E. (2011) Internal audit function: an exploratory study from Egyptian listed company, *International Journal of law and management*, 53(2), 108-128
- Ernst and Young (2011) *Growing beyond: a place for integrity, the 12th Global Fraud Survey*
- Fadzil, F.H., Haron, H. and Jantan, M.(2005) Internal auditing practices and internal control system, *Managerial Auditing Journal*, 20(8), 844-866
- Federal Bureau of Investigation (FBI) (2009), *Financial Crimes Report*.
- Flesher, D.L (1996), *Internal Auditing: Standards and Practices*, Altamonte Springs, FL: The Institute of Internal Auditors
- Fraud Act 2006 (The U.K)
- Hillison, W., Pacini C. and Sinason D.(1999), The internal Auditor as fraud- buster, *Managerial Auditing Journal*, 14 (7), 351-362
- Institute of Internal Auditors (2001) *Standards for the Professionals Practice of Internal Auditing*.
- Grazioli, S., Johnson, P.E., Jamal, K. (2006) A cognitive approach to fraud detection
- Kang, S.M(2001), The listing requirements of Kuala Lumpur Stock Exchange: What Directors and Senior Management Need to Know, *Malayan law Journal Sdn Bhd, Petaling Jaya*

18. KPMG International (2005) Fraud Survey 2004 Report, KPMG Forensic (Malaysia) in collaboration with Royal Malaysia Police.
19. Leung, P., Cooper, B.J and Perere, L.(2011) Accountability structures and management relationships of internal audit: An Australian study, *Managerial Auditing Journal*, 26(9), 794-816
20. Lys, T. and R.L Watts (1994) Lawsuit against auditors, *Journal of Accounting research*, 32, 65-93
21. National Commission on Fraudulent Financial Reporting (1987) Report of the National Commission on Fraudulent Financial Reporting.
22. PriceWaterHouse Coopers (2005), Survey, Economic Crime Survey: people, culture and controls, The 4th Biennial Global Economic Crime
23. PriceWaterHouse Coopers (2007), Survey, Economic Crime Survey: people, culture and controls, The 4th Biennial Global Economic Crime
24. Ratcliffe, T.A and Landes, C.E (2009) Understanding Internal Control and Internal Control Services, *Journal of Accountancy*, 9 (2009)
25. Rezaee, Z. (2002) Causes, consequences and deterrence of financial statement fraud, *Critical Perspectives on Accounting*, 16 (2005), 277-298.
26. Reinstein, A. Moehrlr, S.R and Moehrlr, J.R. (2006) Crime and punishment in the marketplace: Accountants and business executives repeating history. *Managerial Auditing Journal*, 21 (4), 420-435
27. Schleifer, L.L.F and Greenawalt, M.B (1996) The Internal auditor and the critical thinking process, *Management Auditing Journal*, 11(5), 5-13
28. Soh, D.S.B and Bennie, N.M (2011), The internal audit function: Perceptions of internal audit roles, effectiveness and evaluation, *Managerial Auditing Journal*, 26(7), 605-622
29. Statement on Auditing Standard (SAS) No.99, Consideration of Fraud in a Financial Statement Audit.
30. Summers.B (2008), The Fraud Act 2006; has it had any impact? *Amicus Curiae*, (75).
31. Theft Act 1968 (The UK)
32. Zhang, Y., Zhou, J. and Zhou, N. (2007) Audit committee quality, auditor independence and internal control weaknesses, *Journal of Accounting and Public Policy*, 26(3), 300-327

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# On Protection System of Juveniles in View of Public Interest Litigation

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**Abstract.** China's juvenile protection of the legal system has a certain problem, which has led to frequent violations of minors' rights and interests in recent years. These cases have shown violations of the non-specific nature of minors, so it is imperative to bring a corresponding public interest suit against the interests of minors. Through public interest litigation, it can greatly enhance the level of protection of Chinese minors. The civil affairs departments and their establishment of child welfare institutions, women's federations, the Communist Youth League and other social organizations and prosecutors should be the main body of the juvenile public interest litigation, especially the prosecution of minors' public interest litigation should be to fulfill its legal supervision duties.

**Keywords:** Minors 'rights and interests; public interest litigation; maximization of minors' interests.

The term public interest litigation began in the 1960s. At that time, many social systems in the United States were challenged, followed by various attempts to reform the program, the establishment of a large number of public legal institutions and similar advocacy system. They are for the environment, consumers, women, colored people, minors and similar social and public interests of many activities. The resulting litigation is called public interest litigation <sup>[1]</sup>. Public interest litigation is the maintenance of public welfare for the purpose of the litigation system. In recent years, many minor exposures to the frequent exposure of the incident, but also strongly reflects the survival and development of some of China's minors is really worrying. Therefore, it also has the necessity and feasibility for the interests of minors involved in matters related to public interest litigation.

## 1. An Analysis of the Current Situation and Existing Problems of the Legal System of Juvenile Protection

### *1.1 The Current Situation of China 's Juvenile Protection Legal System*

At the legislative level, the state has always been concerned about the protection of the rights and interests of minors and attention, and achieved some success. Since the reform and opening up has promulgated the "People's Republic of China Minors Protection Law", "Compulsory Education Law of the People's Republic of China", "People's Republic of China Prevention of Juvenile Delinquency Law" and other specialized laws, and in the "Marriage Law" ", "Inheritance law "and many other laws in the protection of the rights and interests of minors related laws. In addition, China has signed the United Nations Convention on the Rights of the Child and its two protocols, the establishment of the State Council Working Committee on Women and Children and the Central Committee for the Management of Public Security to prevent juvenile delinquency. In order to promote the further development of the cause of minors in China, the second decade of this century, the State Council promulgated the "China Children's Development Program (2011-2020)" in accordance with the relevant laws and regulations and the actual situation of the development of Chinese minors. After the Fourth Plenary Session of the Eighteenth Central Committee put forward the overall goal of comprehensively promoting the rule of law, the Supreme People's Court, the Supreme People's Procurator, the Ministry of Public Security and the Ministry of Civil Affairs jointly issued the

Opinions on Several Issues Concerning the Handling of Guardians' Rights and Interests Against Juveniles According to Law (hereinafter referred to as "Processing of opinions"), the relevant judicial interpretation of the law involving minors in order to better protect the rights of minors. The following year, the Standing Committee of the National People's Congress passed the Anti-Domestic Violence Act, which further protected the legitimate rights and interests of the underdogs.

In judicial practice, the court has been particularly concerned about cases involving minors. As early as 1991, Changzhou City, Jiangsu Province, Tianning District Court will involve minors criminal, civil, administrative cases integrated in a juvenile complex. This initiative has been the highest people's court's attention and guidance, "Tianning model" along with the country to be promoted, the development of China's juvenile civil trial began to the professional road. Although China's juvenile civil trials have experienced many twists and turns in the development of more than 20 years, there are still many shortcomings and deficiencies. However, under the influence of existing subjective and objective factors, the Chinese juvenile civil trial pattern has begun to take shape, in the juvenile trial institutions have been initially formed in the Supreme People's Court set up minors trial working group, the local pilot schools set up juvenile comprehensive court pattern. At present the national courts have a total of more than 2,300 juvenile courts, minors in the trial of more than 7400 judges, more than 2,700 clerks to assist juvenile judges to work <sup>[2]</sup>. With the deepening of the trial of minors' civil events, the practice has gradually shifted the focus on cases to the settlement of the family problems behind minors, and there has been a pattern of merging family matters into juvenile courts. In 2014, the Supreme Court juveniles and family cases were merged into juvenile court reform. The establishment of the juvenile family court is in line with the law of the judicial remedy of the rights of minors, which reflects the rationality and maturity of the judicial practice of juvenile rights and interests in the process of protecting the rights and interests of minors.

## *1.2. The Problems Existing in the Legal System of Chinese Juveniles' Protection*

### *1.2.1 The status of juvenile litigation is missing*

All natural persons can take civil action as a plaintiff when their civil rights are infringed, and the minor has the corresponding civil rights, but the civil capacity is not everyone can enjoy. According to the General Principles of Civil Law, which is to be implemented on 1 July 2017, minors under the age of eight are civil capacity, and minors aged 8 to 16 are considered to be limited to civil capacity, and under 16 years of age Citizens who acquire their primary livelihoods with their own labor are considered to have full civil capacity and those who are 18 years of age or older are adults with full civil capacity. Civil action is a serious and complex civil activities, so in addition to 18 years of age as a full civil capacity and a part of the 16-year-old under the age of 18 and their own source of life outside the minors, other minors do not have Litigation capacity, by its legal representative of its civil action. The legal agent of a minor in a civil action is only a litigation agent, not a plaintiff. But in reality, juvenile parties rarely participate directly in litigation, involving cases often degenerate into ordinary cases between adults. Although these cases are often litigation surrounding or related to the rights of minors, minors are excluded from the decision-making process associated with them because they are considered to have no sufficient cognitive and judgmental powers, and their right to participate in the proceedings is Weakened. The judge cannot hear the wishes from the minors, but cannot see the situation of minors. And Taiwan region of China in the legislation clearly given the qualifications of minors' litigation, minors have the right to influence their decisions to express their views, which is in fact the protection of juvenile litigation rights of the inevitable requirement. <sup>[3]</sup>

### *1.2.2 Defects in national procedural law*

For a long time, the civil procedure of the Chinese minor has nothing to do with the ordinary civil case between adults. It is the principle of "party litigation mode, supplemented by authoritarianism", emphasizing the negative evidence of the parties' evidence and the judge referee. Such a litigation model lacks a special procedure to run in line with the characteristics of minors, reflecting the needs of minors and facilitating juvenile litigation. Litigation, the mentally immature minors to face directly from the relatives of the dispute, as the relatives of the parties in order to fight for their own power, in the case of trial proceedings, the debate must have a very intense process of confrontation, some minors The case will lead to multiple litigation many appearances, which are suffering for minors.

Minors psychological tolerance is poor, these adverse conditions will directly affect their future healthy growth, but also hurt the young heart, fear of family and cause insecurity. And the current civil proceedings, the trial is too serious, nor suitable for minors to participate.

### 1.2.3 Legislation behind practice

In a comprehensive deepening of the judicial reform today, courts across the country are actively exploring ways to properly solve juvenile cases. Some courts in the case of the trial process, pay attention to minors own mental health problems, through the establishment of psychological intervention mechanism, hire experts not only for minors psychological counseling, but also psychological training of judges, so that judges can more detailed understanding of the intention of the adults to make the most favorable decision to protect the rights and interests of minors; and some courts in the centralized trial of marriage, parent-child relationship caused by minors and related personal rights disputes and property rights disputes associated with this, the collegial panel In particular, it is composed of judges who are familiar with marriage and family trials and experienced judges, and are equipped with at least one female judge and, if necessary, inviting women cadres, child psychologists, etc. as people's jurors; this means that the court has become aware of the law's backwardness , But also to their own trial practice to fill the gaps in the relevant legislation.

1.2.4 The results of the judicial decision did not fully reflect the principle of maximizing the rights and interests of minors

In the litigation involving minors' rights and interests, the core purpose of the judge's trial is to protect the rights and interests of minors from infringement, give full consideration to the wishes of the minors themselves and make a fair judgment. However, the maintenance of the rights and interests of minors in real life is a huge, systematic project, the need for family, society, government, schools, judiciary and other institutions of collaboration. Unfortunately, the linkage mechanism of protection of the rights and interests of minors in China, although in existence, lacks effectiveness. Especially the lack of government departments, the strong participation of social professional institutions, which limits the development of minors' litigation, so that judges in practice is often difficult to achieve the protection of the interests of minors' referee needs. For example, in recent years, there have been many incidents of guardian child abuse in China, but the actual judgment of the revocation of the guardian's case is rare in practice, the most important reason is that the civil affairs departments of the follow-up resettlement work of these children, so that the judge revocation of guardianship cases in the dilemma, it is difficult to judge. The judge of the case only most of the cases can only be critical of the guardian of the education after the judge still maintain the original custody relationship, but some of the guardian after the verdict is still difficult to change, causing some minors or fleeing families become wandering begging children, or because of abuse Leading to the final death of the disabled.

## 2. The Possibility of Introducing Juvenile Protection in Public Interest Litigation

Although China has made some achievements in the protection of minors, but the problem is still in violation of the rights and interests of minors' frequent vicious incidents. These cases present violations of the non-specific nature of minors, as well as the lack of responsibility and the abuse of guardianship. Which greatly endanger the legitimate rights and interests of minors, so the introduction of public interest litigation into the protection of minors possible and should be imperative.

### 2.1. *Public Interest Litigation - Protection of Non-Specific Community Rights and Interests*

The Chinese procedural law only provides for joint litigation, representative litigation and agency action, and does not delineate public interest litigation and non-public interest litigation from the effect of litigation or litigation. On the definition of public interest litigation, the academic community has no clear understanding of this. The author believes that the so-called public interest litigation refers to the specific state organs and related organizations, individuals, according to the law of the authority to violate laws and regulations, violations of state rights and interests, public interest and social rights and interests of the act, to the court proceedings, Its legal activities. Public interest litigation is relative to private interest litigation, private interest litigation is to protect citizens,



legal persons of the legitimate civil rights and interests arising from the litigation; public interest litigation is caused by the protection of public interest litigation. Usually the academic circles of the "Civil Procedure Law" 55 involved in the infringement of many legitimate rights and interests of consumers and environmental pollution cases classified as public interest litigation cases. But these two cases cannot cover all the public welfare cases, the scope of its provisions is too narrow, as early as 2012, Professor Jiang Wei, the Civil Procedure Law proposed amendments to the proposed public interest litigation as a basic principle of civil litigation, but also further refinement Introduce the system of public interest litigation in special procedures.<sup>[4]</sup> It can be seen that the scope of the case stipulated in Article 55 of the Civil Procedure Law in China is far less than the scope of public interest litigation, which also lays the legislative feasibility for the establishment of public interest litigation for the protection of minors.

### *2.2. Minors' Rights and Interests - an Interest that Requires Special Protection*

Under 18 years of age, adults and adults, their mental, physical development and other aspects of the particularity of the social vulnerable groups determine the basic attributes, they are easily emotional instability, lack of self-control and self-recognition know that there is no resistance to external injury, do not have the ability to live independently, they are extremely dependent on adults. The above characteristics of minors lead to the difficulty and low operability of their rights and interests: First, although minors guardians or guardianship agencies have the function of protecting their rights from infringement, they are often caused by the discontinuities of the infringing events Concealed and decentralized, resulting in the difficulty of excessive rights, cost is too high, the guardian or guardianship agencies and thus lazy or no ability to drive their custody; Second, the physical and mental characteristics of minors and understanding, judgment, control The development of the degree, it cannot take the initiative and timely feedback on the infringing, resulting in the lack of evidence and adversely affected the best rights opportunities; Third, the law gives certain administrative organs, institutions and other units have the function of protecting the rights of minors, but Due to the system is not perfect, the specification is not complete, and even the staff of dereliction of duty, resulting in difficulties encountered on the bucking, to infringes the interests of minors to take advantage of the opportunity.

### *2.3. A New Way to Protect the Rights and Interests of Minors from the Public Welfare Category to the Rights and Interests of Minors*

The successor of the Chinese dream of being a prosperous, democratic, civilized and harmonious socialist modernization and the great rejuvenation of the Chinese nation is the most valuable asset of the state and society, and even the whole nation. A country or nation treats minors. How the attitude directly affects the country's future and the revitalization of the nation. The rights and interests of minors are closely related to the rights and interests of the state, with significant public welfare, is a typical public interest. The protection of the rights of minors, not only to protect adults in general to protect their rights in criminal justice, more important is to protect its increasingly extensive civil rights. For the analysis and interpretation of Article 55 of the Civil Procedure Law, as well as the definition of public interest litigation and the understanding of extension, the mention of public interest litigation does not need to be related to the incident, but the legal authorization can be. In modern society, many countries have set up special minors to protect their duties and carry out protection and supervision work with specialized agencies, and use legal means to confirm and realize the protection of minors. With the implementation of the Anti-Domestic Violence Act and the implementation of the "Opinion", the protection of the rights and interests of minors has really been carried out by the private sector to the public domain. Article 55 of the Civil Procedure Law invoked the case of the protection of the rights and interests of minors initiated by the public interest litigation model from time to time. The introduction of public interest litigation and the protection path of the rights and interests of minors showed a high degree of fit.

## **3. Minors Protect the Scope of Public Interest Litigation Cases**

### *3.1. The Guardian of the Infringing on the Personal Rights and Property Rights of the Minor*

According to the Beijing Youth Legal Aid and Research Center survey data found that 697 cases of 84.79% of cases in the case of parental violence, of which the actual parents of violence accounted for 74.75%, step-parents or foster parent violence accounted for 10.04%; all cases of parents' unilateral violence cases More common, accounting for 76.47%.<sup>[5]</sup> Indeed, China as a deeply influenced by the Confucian culture of the country, "stick under the filial piety" This view has been regarded as a writer's motto, and corporal punishment has become a lot of parents to educate their children. Although the Anti-Domestic Violence Act has been promulgated and implemented, there are operational deficiencies, such as the absence of remedial measures for juvenile domestic violence. I believe that Western countries in the prohibition of domestic violence measures worthy of our study, many states in the United States have provided guardians to implement violence, abuse, abandoned forced prosecution system, that is, when the law enforcement officers found or have sufficient reason to believe the guardian of the guardian of violence, abuse, abandonment, Law enforcement officers must arrest their guardian and subsequently file a custody of custody. At the same time, Norway has established an unconditional judicial prosecution system to give the public prosecution agency without parental consent to abuse their parents to sue. I believe that China should be as soon as possible domestic violence, abandoned minors case into the public interest litigation system, by the state on behalf of the prosecution of their parents, so as to achieve protection of minors.

### *3.2. Non-Guardian of the Infringing on the Personal Rights and Property Rights of Minors*

First, the commercial owners deliberately for the implementation of minor injuries to their health rights and property rights of commercial behavior. Such as selling alcohol and tobacco to minors. Although article 37 of the Law on the Protection of Minors provides that "the prohibition of the sale of alcoholic drinks and tobacco to minors, the operator shall set a sign of not selling alcoholic beverages to minors in a prominent position; if it is difficult to ascertain whether it is an adult, asking them to produce identity documents. "But in real life by alcohol and tobacco sellers on the obvious less than 18-year-old sales object turned a blind eye, and even some black heart merchants deliberately lure and promote tobacco and drink to minors. Such as the sale of fake and shoddy toys and pirated books for minors, as well as certain lawless elements to the juvenile implementation of high interest lending and so on are the minor interests of the greater harm; Second, due to the lack of relevant laws and regulations, business indirect infringement of the interests of minors by the commercial conduct of the subject on unspecified objects. Such as electronic and paper publications, as well as violent pornography in film and television drama and online games and other electronic entertainment products for minors' poison. Modern society has been fully into the information society, with new media as the representative of the mass media carrier is full of violent pornography content. In the daily life of minors in the active or passive acceptance of this content will lead to its precocious or violent behavior, eccentric. And because of the poor self-control of minors, online games and other social software on its temptation is more difficult to resist. According to the China Internet Information Center (CNNIC) 39 China's Internet development survey shows that in 2016 China's 19-year-old Internet users have reached 170 million, accounting for 23.4% of all Internet users, and the growth rate is quite amazing. Minors first hit the network the most concentrated age has been reduced from 15 years to 10 years old. Indulge in the network not only cause the minor to escape the will of the will, indifferent life, escape reality and other adverse psychological reactions, more likely to imitate the network scene of the harsh criminal offenses; Third, other subjects in the implementation of illegal or criminal activities on the rights of minors the infringement. This case mainly deals with the areas of traditional public interest litigation, such as the destruction of the environment and the safety of food and drug safety. It also causes similar adult damage to a certain range of unspecified minors. However, due to the physical and mental development of minors Adults, these acts are more likely to cause serious harm to their health, and therefore worthier of public interest litigation concerns.

### *3.3. Administrative Organs, Public Institutions and other Units and Groups Violate the Non-Traditional Civil Rights and Interests of Minors*

In practice, the administrative organs that have the responsibility to protect, supervise and manage the duties of minors are often violated by exercising their functions or actions or failing to prevail, and

the interests of the minor are infringed upon. Among them, the right to juvenile education is the most common infringement, such as 2005, Qianjiang City, Hubei Province, some primary and secondary schools have long-term phenomenon of arbitrary charges, primary and secondary school students and their parents believe that Board of Education and the Bureau of Price Administration Behavior and Illegal of Qianjiang, and make their own interests have been lost, 14 primary and secondary school students will Board of Education and Price Bureau of Qianjiang to the Qianjiang People's Court.<sup>[6]</sup> In addition, there are violations of the educational subject's right to education, the right to school, and so on. Such as underage disabled people, underage AIDS and hepatitis and other patients in the education and medical services and other services vulnerable to unfair treatment and discrimination. At present, China's lack of effective measures for the protection of minors suffering from infectious diseases, relying on administrative intervention often can only solve individual problems, it is imperative to also such acts into public interest litigation.

#### **4. Juvenile Protection of Public Interest Litigation Plaintiff Qualification**

##### *4.1. Civil Affairs Department and its Establishment of Child Welfare Institutions*

According to the two, two high "processing opinions", the civil affairs department as a legal organ, its obligation to take custody of juvenile custody. Article 27: "The following units and personnel (hereinafter referred to as the relevant units and personnel) have the right to apply to the people's court to revoke the guardian qualification: ... (3) the civil affairs department and its establishment of minors rescue protection agencies; Article 30, paragraph 2: "The People's Procurator shall, in writing, recommend that the local civil affairs department or the minors' aid protection and protection institution to the people's court of the People's Procurator shall, in accordance with the provisions of Article 35 of the present Opinion, So that when the rights and interests of minors involved in social rights and interests have been infringed upon, the government civil affairs departments should protect the rights of minors to do the duties of the door, in the encounter or related personnel to report should be Immediately involved in the investigation, if necessary, to lift the prosecution of the prosecution.

At present, the Chinese civil affairs departments under the child welfare agencies, only to receive orphans, abandoned children, no guardian of minors. May be due to the limitations of its protection of the main, play an important role in child welfare agencies in the "treatment" was exempted from liability. "Treatment Opinions" clearly stipulates that minors' aid protection agencies include only relief management stations and minors' relief protection centers, which are protected against wanderers. I believe that the child welfare agencies compared to the rescue management station, minors rescue protection center, there are more social forces support. "Civil Procedure Law" provides that the relevant organizations can bring a lawsuit to the people's court, so that the relevant organizations involved in public interest litigation in legislation has been clearly recognized. To this end, it cannot be pushed to the child welfare institutions, so that in public interest litigation to protect the protection of minors to maximize the protection of one of the main.

##### *4.2. Women's Federation, the Communist Youth League and other Social Groups*

According to the Law on the Protection of Minors, the protection of minors is the common responsibility of state organs, armed forces, political parties, social organizations, enterprises and organizations, urban and rural grassroots self-government organizations, guardians of minors and other adult citizens. Article 5 of the "Opinion " also stipulates that " The people's court, the people's Procurator, the public security organ and the civil affairs department shall strengthen the contact and cooperation with the women's labor committee, the education department, the health department, the Communist Youth League, the women's federation, the working committee and the minors' Actively guide, encourage and support legal services, social work service agencies, charitable organizations and volunteers and other social forces, and jointly do the protection of the protection of minors protection work." But from a specific level of work, the responsibility for the protection of more than the Communist Youth League in the minors under the Ministry of Protection Committee and the Women's Federation under the Women's Working Committee under the exercise.<sup>[7]</sup> In the actual work, the Minors Protection Committee and the Working Committee of Women and Children have long been committed to the protection of the rights and interests of minors, and often with the

education, health, industry and commerce, public security and other departments sincere cooperation, have a good organization and coordination. In addition, the relevant staff to learn the law, often to protect the rights and interests of minors the latest legal training, so I believe that the Minors Protection Committee and the Working Committee on Women and Children on behalf of the exercise of minors public service litigation function is very feasible, in the proceedings, Whether it is investigating evidence or protecting the best interests of minorities have an advantage.

#### *4.3. Procurator Departments*

For a long time, the procurator departments have accumulated rich experience in the protection of minors in the course of criminal proceedings. In order to protect the legal rights and interests of minors in criminal proceedings, the procurator departments of some areas have also established minors' criminal prosecutors. Procurator departments in the criminal justice in a special juvenile indictment procedure for the physiological characteristics of minors' familiar with the civil public interest litigation has accumulated considerable litigation experience. This shows that given the prosecution in the minors to protect public interest litigation is also very appropriate.

### **5. Constructing the System of Public Interest Litigation Protection for Juvenile Rights and Interests with Procurator Department as the Main Body**

#### *5.1. The Procurator Should Become the Core Subject of the Protection of the Rights and Interests of Minors*

First, the prosecution is to mention public interest litigation more appropriate subject. Under the reality of China, it is more appropriate and more effective to talk about the unavoidable problem of public interest litigation in theory. The power act exercised by the procurator in the Chinese judicial system does not have the essence of disposition, and the identity is relatively detached from the other judicial organs or the administrative organs. In addition, the procurators of the staff, hardware and other equipment, compared with other subjects more advantages. Public interest litigation investigation and evidence difficulty and relatively high cost of litigation requires a professional litigation group to take responsibility for prosecution, from the current stage and even for a long period of time to see, only the most appropriate prosecution. Second, the prosecution as a maintenance of national and public interest on behalf of the identity dictates. China's national conditions and the nature of the procurators have determined that the procurators should take the maintenance of the state and the public interest as their primary duty. They must supervise the trial process and the results of the court in accordance with the law and have the duty and obligation when the state and public interests are impaired on behalf of the state and society to recover. The Civil Procedure Law and the Administrative Procedure Law also stipulate that the People's Procurator has the power to supervise the civil and administrative litigation respectively. The procurator has also participated in the second instance procedure of civil and administrative litigation through the exercise of the right of protest. Third, the relevant policies and documents also give the procurators public service litigation main functions. The "Decision of the Central Committee of the Communist Party of China on Several Important Issues Concerning the Administration by Law" requires the procurators to actively explore and establish the system of public interest litigation, give full play to the role of the procurators to supervise the functions of the procurators, promote law enforcement, strictly enforce the law, safeguard the constitutional legal authority and safeguard social justice. In July 2015, the Supreme People's Procurator issued the "Procurator Office to bring public interest litigation pilot program", proposed in 13 provinces and cities to explore the implementation of the procurators to initiate public interest litigation system, to achieve the prosecution public interest litigation from the theoretical high-profile into the judicial practice of transformation, Which is the current prosecution agencies to carry out public interest litigation is the most powerful and most direct basis of the source.

#### *5.2. Several Patterns of Public Prosecution on the Protection of Juvenile Rights and Interests*

In addition to the "Procurator Office of public interest litigation pilot program", the "Civil Procedure Law" Article 14, 15 and 55 provides some of the main body to enjoy the supervision and prosecution, to support prosecution, protest and directly bring the power of public interest litigation,

the prosecution can distinguish between different Situation, and combined with a specific stage of litigation: When the rights and interests of minors have been seriously infringed, there is a clear litigation subject but lazy to exercise the right of action, the prosecution may be prosecuted and other forms of supervision and prosecution, if it is still not prosecuted, the prosecution The prosecution or other subjects have filed a lawsuit, but the need for procurators involved in the proceedings, the prosecution can support the prosecution of the way involved; when the juvenile rights and interests of the referee is wrong, the prosecution in accordance with the law To prosecute; when there is no corresponding subject can bring a lawsuit, or do not want to sue, the prosecution can directly sue as a plaintiff. Of course, for the actual existence of some prominent problems, and sometimes it is necessary to take a combination of four modes, the specific operation can be flexible use, should not be too mechanized.

### *5.3. Several Issues that Need to Be Discussed*

Although the law and related documents stipulate several modes of procurators involved in public interest litigation, but because there is no corresponding system to support, resulting in the protection of juvenile rights and interests of public interest litigation has not been able to form a long-term stable mechanism, so how to build In line with China's national conditions of the juvenile public interest litigation system is still the current China's Justice Bureau is facing a major problem. On specific procedural issues, there are several issues worth discussing and clarifying: First, about litigation participants. When the procurator commits a public interest litigation against the guardian or other civil subject in the capacity of the public interest litigant, the defendant shall be a citizen, legal person or other organization that inflicts the social public interest. The defendant shall have no right of counterclaim in such public interest litigation; The defendant is an administrative organ that has the power to violate the lawful rights and interests of the minor or does not act as an administrative authority for the protection of the rights of the minor, when the public interest litigation is brought to the administrative organ, public institution or other organization as a public interest litigant, and Laws, regulations, rules and regulations of the organization. Second, the effective use of pre-trial procedures. We should give full play to the supervisory function of procurators and try to urge prosecution as much as possible. Time, to "maximize the interests of children" as the guide, fully grasp the procurators to urge the prosecution of the time, in addition to change, revocation of custody and other cases without limitation of the limitation period, should be within two years of the limitation period The Other cases that occur within the family should be promptly dealt with in a timely manner. Upon the initiation of the supervision and prosecution, the relevant supervisory organization or organization shall, within a reasonable time, bring a lawsuit in accordance with the law and return the handling of the situation in writing to the procurator. In the case of the above-mentioned pre-process without the case, the prosecution should be self-litigation. Third, there must be a clear claim. The procurator may submit to the people 's court a request for the defendant to stop the infringement, to remove the obstruction, to eliminate the danger, to restore the status quo, to compensate for the loss, and to apologize for the cause of the protection of the juvenile rights and interests of the guardian or other civil subject. The procurator may propose to the people's court to revoke or partially revoke the illegal administrative act against the minor, to perform the statutory duties within a certain period of time, or to confirm that the administrative act is illegal or invalid or that the administrative act is invalidated or invalidated by the administrative organ or other organization. And so on. Fourth, the burden of proof should be allocated rationally. Juvenile public interest litigation mainly around the realization of the rights and interests of vulnerable groups to protect, we must fully consider the rationality of the distribution of the burden of proof. The proof of the burden of proof can draw on the principle of evidence of administrative litigation, that is, by the prosecution to bear the burden of proof of the facts, the defendant to bear the burden of proof of its legitimacy. Fifth, the rational sharing of litigation risk. The purpose of the juvenile public interest litigation and the nature of the procurator itself determines that the risk of such litigation should be borne by the state and the society, that is, the interest after the victory should belong to the minor, and the relevant expenses and responsibilities after the defeat shall be borne by the state.

## References

1. Chen Hongwei. Public interest litigation calls for legislation [N]. Legal Daily. June 17, 2004: 2. (In Chinese)
2. Luo Shuzhen. Supreme court held public open day activities of law around - for the escort [OL]. Chinese Trial Official Website. <http://www.chinatrial.net.cn/news/1550.html> (In Chinese)
3. CHEN Ai—wu. Family Litigation and Protection of the Interests of the Child [J]. Northern Legal Science. 2016, (6): 126-139. (In Chinese)
4. Xuan Mengjie. A new way to protect minors - juvenile protection of public interest litigation [J]. Journal of Hubei University of Economics (Humanities and Social Sciences). 2015, 12(8): 95-98. (In Chinese)
5. Investigation and study of cases of juvenile suffering from domestic violence [OL]. Youth Rights Website. <http://www.chinachild.org/b/rd/7041.html> (In Chinese)
6. Li Xiang. Discussion about the invasion of authority on miners' rights to receive education and the way of the legal redress [D]. Master's Degree Thesis. Guangxi Normal University. 2007. (In Chinese)
7. Yang Xiaohui. On the construction of the protection system of juveniles based on the socialization demand of "whole people" [D]. Master's Degree Thesis. Graduate School of Chinese Academy of Social Sciences. 2012. (In Chinese)

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# Social Snacking with a Virtual Agent – On the Interrelation of Need to Belong and Effects of Social Responsiveness When Interacting with Artificial Entities

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**Abstract.** Based on considerations that people's need to belong can be temporarily satisfied by "social snacking" (Gardner et al., 2005) in the sense that in absence of social interactions which adequately satisfy belongingness needs surrogates can bridge lonely times, it was tested whether the interaction with a virtual agent can serve to ease the need for social contact. In a between subjects experimental setting, 79 participants interacted with a virtual agent who either displayed socially responsive nonverbal behavior or not. Results demonstrate that although there was no main effect of socially responsive behavior on participants' subjective experience of rapport and on connectedness with the agent, those people with a high need to belong reported less willingness to engage in social activities after the interaction with a virtual agent – but only if the agent displayed socially responsive behavior.

**Keywords:** Virtual agents; social snacking; need to belong; socially responsive nonverbal behavior; rapport.

## 1. Introduction

In our daily lives, we interact more and more with all kinds of technology. In order to render these interactions with machines more intuitive and usable, research groups engage in developing autonomous virtual agents which are able to interact with the human user by means of verbal and nonverbal cues (Kopp et al., 2007; Bickmore, 2004). This development incorporates human-like cues into the interface, and with this new social dimensions enter human-technology interaction. Previous research demonstrated that people already act socially towards computers which interact with human-like cues such as speech (Nass et al., 1994; Reeves & Nass, 1996). These social reactions, for example, showing politeness or reciprocity towards the agent, become even more pronounced when an interface agent (such as a face) is presented on the screen (Gratch, Wang, Gerten, Fast, & Duffy, 2007; Hoffmann et al., 2009; Krämer et al., 2013b).

While social effects of virtual agents have been well documented (Krämer, 2005) and potential reasons for users' social reactions have been discussed in depth (Nass & Moon, 2000; Shechtman & Horowitz, 2003), there is considerably less research on the question of whether the social interaction with artificial entities is experienced as socially rewarding and can fulfill social needs in a way similar to human-human-interaction. These questions, however, become increasingly important as agents are foreseen to not only serve as interface technology in service realms (information kiosks), as navigation support (on websites or in automatic teller machines) but will most likely also be employed as companions (to provide the opportunity for basic social interaction for senior citizens

deprived of social contact). It therefore becomes important to analyze whether conversations with virtual agents are capable of fulfilling social needs in the sense of satisfying people's need for contact. Although it will not be assumed that the conversation with virtual agents might be able to substitute for social contact with fellow humans, it can be argued that virtual humans might serve as “social snacks” as described by Gardner et al. (2005). This would mean that – when social interaction with fellow humans is not available - people might temporarily satisfy their social needs by settling for a snack which helps them to wait for the more adequate need satisfaction. That humans have a fundamental need for contact and belonging has aptly been described in a seminal paper by Baumeister and Leary (1995). Additionally, it has been demonstrated that regular and meaningful social contact is important for people's health (Cacioppo & Patrick, 2008). Although the need to belong as a fundamental need is characteristic for all humans, there are idiosyncratic differences (Kelly, 2001). Also, Leary et al. (2005) have suggested that there are individual differences in need to belong and provide a scale to assess the individual need to belong.

The goal of the present study is to explore to what extent conversations with virtual agents can satisfy social needs and to what degree this is dependent on people's individual need to belong. As a crucial factor which might affect the social satisfaction resulting from a conversation with a virtual human, we analyze the influence of the quality of the interaction in terms of socially responsive nonverbal behavior (smiling, nodding) provided by the agent (Gratch et al., 2007b). This work is intended to provide support for the idea that virtual characters under specific circumstances can be considered as real conversation partners and, therefore, can alleviate people's need for social contact. In order to test the presented assumptions, the participants interacted with a virtual character, the so-called Rapport Agent who shows socially responsive behavior (Huang et al., 2011).

## 2. Social effect of virtual agents

Cassell, Bickmore, Campbell, Vilhjálmsón, and Yan (2000) coined the term Embodied Conversational Agents (ECA) to describe computer generated anthropomorphic interface agents that employ humanlike behavior within a dyadic conversation with a human user. ECAs “may [therefore] be defined as those that have the same properties as humans in face-to-face conversations” (Cassell et al., 2000, p. 1) and as such, ECAs are capable of perceiving verbal and nonverbal cues and subsequently reacting on the given input. They are equipped with feedback and turn-taking features. Moreover, they are able to engage the user in a relevant conversation using social cues such as speech, gestures and gaze (Bickmore & Cassell, 2005).

Several researchers assume that people accept virtual characters as fellow conversation partners (Ryokai et al., 2003; Miller et al., 2011). Indeed, numerous studies have shown that people exhibit social behavior towards virtual characters and that their communication strategies resemble those used in human-human interaction (Nass & Moon, 2000; Krämer, 2005; Krämer et al., 2013b). Even though a conversation with a virtual character does not come close to a natural conversation between two individuals, it was demonstrated that numerous forms of social effects occur while interacting with a machine. Social effects in this context are commonly understood as people's display of emotional, cognitive and behavioral manners when a machine is present. These manners are similar to those people display when talking to another individual and range from showing impression management tendencies (Kiesler et al., 1996) to using more natural speech instead of other input modalities (Krämer, 2005) when reciprocating to an agent's smile (Krämer et al., 2013b). While these tendencies have been shown for the interaction with (talking) computers (see studies within the Media Equation and Computers as social actors paradigm, Nass et al., 1997; Fogg & Nass, 1997), current studies indicate that effects might even be more pronounced when humans are confronted with more realistic social cues in terms of an agent's human-like appearance and nonverbal cues (Hoffmann et al., 2009; von der Pütten, Krämer, Kang, & Gratch, 2010).

The reasons for these social reactions have already been discussed widely: while Kiesler et al. (1996) assume that these behaviors are merely triggered by demand characteristics of the (laboratory) situation and can be interpreted as superficial “as though” reactions, Nass and Moon (2000) argue



that the behavior is profoundly social (termed *ethopoeia*). They assume that although all users consciously know that the computer does not warrant human treatment, they cannot help acting socially due to humans' social nature. People mindlessly display social behavior as soon as they perceive a potential interaction partner – as long as he/she/it displays basic social cues. The computer or agent triggers a set of behavioral scripts that makes it unlikely for the user to actively process and reflect information (von der Puetten et al., 2010). Kappas (2005) emphasized that humans have a basic need to react socially towards potential interaction partners as they feel incomplete when they are alone and therefore are in persistent search for dyadic interaction and in this sense are “free monadic radicals”.

In summary, previous research supports the idea that people unconsciously act socially towards computers even though they know that it is a computer that does not warrant social treatment. Further, it has been demonstrated that a minimal set of human-like cues are sufficient to encourage people to engage in social dialogue with computers. While only a minimal set of cues is required to elicit social manners, however even stronger social reactions occur when humans are presented with more human like cues.

It seems that people are eager to conduct social dialogue with computer agents and that social effects can be generated automatically. The occurrence of social effects and the readiness to interact with virtual characters are of particular interest for this work as this paper explores the potential satisfaction people can get through human-machine interaction. Bickmore (2004) not only presumed a human readiness but even a need to engage in more profound human-machine dialogue.

### *2.1. Need to belong*

Both the *ethopoeia* assumption and the notion that humans feel incomplete when they are alone demonstrate that the human need to belong is an integral part and prerequisite of people's willingness to converse with virtual interaction. Most personality theories include the idea that people have a natural drive to affiliate with others. Baumeister and Leary (1995) complemented this idea by claiming that this drive is more than an affiliation desire, it is an actual human need and a fundamental human motivation. Due to this natural need people establish new interpersonal relationships and, at the same time, maintain a certain amount of already existing significant social bonds. People's need to belong is a powerful, universal, and influential human drive that accounts for emotion, cognition and behavior. Social satisfaction can be achieved through social interactions that have to meet certain requirements: on the one hand, the interactions have to take place repeatedly and on a regular basis. Ideally, social bonding is featured with positive or pleasant experiences or should at least be free of negative sensations.

On the other hand, the interaction should bear certain stability and also give both interaction partners the feeling of mutual affective concern (Baumeister & Leary, 1995). There are two ways of satisfying belonging needs: forming bonds and not breaking bonds. Forming new social bonds should happen easily without requiring much effort and has been associated with positive emotions such as joy and happiness (Baumeister & Leary, 1995). People usually refrain from breaking social bonds as it is always related to distress (Cacioppo & Hawkley, 2009; House et al., 1988). Deprivation of social contact is linked to decreasing health and happiness. The effects of social desertion can have impacts on the immune system and can even reach a level where even the human DNA is altered (Cacioppo & Patrick, 2009).

While the need to belong has been described as a fundamental human need, interindividual differences have also been taken into account. People differ with regard to the extent of their need and motivation to engage in social interaction and bonding (Leary et al., 2005). Based on this notion, instruments to assess the individual need to belong in the sense of a trait have been presented (Krämer et al., 2013a; Leary et al., 2005 – the latter scale being especially developed as a predictor for media usage). From this research, we assume that the need to belong helps us to understand people's motives behind social behaviors in human-human interaction and can also be applied to human-computer interaction.

### *2.2. Satiation and social snacking*

Belonging needs are a natural human phenomenon and people constantly reach out to others in order to socialize. However, is this need insatiable? Numerous researchers have shown that individuals only form and maintain a certain number of relationships and when that number is exceeded, the drive to socialize declines (Baumeister & Leary, 1995). Those who are well integrated in a stable social network should hold fewer desires to create new bonds than those who are socially depleted. Figuratively speaking, socializing can be referred to as having a meal. When people's need for social contact is satiated, their social seeking behavior decreases. But when individuals are socially starving – because they feel lonely – they want a meal (Gardner et al., 2005). At times a meal is not readily accessible and people have to be satisfied with a simple snack. Gardner et al. (2005) proposed “that there may be ‘social snacks’ that provide temporary stopgaps for social hunger when a ‘social meal’ (e.g. interaction with an accepting other) is unavailable” (p. 232). Those “social snacks” can satisfy an individual's need at short notice but are not fulfilling, which is plausible: people are hungry, but instead of getting a Lasagna, they have to settle for a Snickers.

Social snacks may work as a surrogate when relevant interaction partners are not available (e.g. in distance relationships, people look at photos or re-read emails) or when people feel lonely due to lack of potential interaction partners. In this context, Gardner et al. (2005) describe social shielding with non-reciprocal parasocial attachments. “Parasocial attachments are defined as attachments to television personae, such as news anchors or fictional characters on sitcoms or soap operas” (Gardner et al., 2005, p. 237). People get attached to surrogates in order to shield from a lack of social contact, and for those high in need of social contacts, it is even possible to bond with completely unrealistic artificial characters (Gardner et al., 2005). Consequently, this raises the question of whether a virtual human can serve as a surrogate and generate the same effects. Specifically, it is not known whether those who have a high need to socially belong can also affiliate with a virtual human and use the interaction as a social snack.

Additionally, Pickett et al. (2004) argued that for individuals high in need to belong, it is especially important to stay socially connected, as their findings depict a relationship between belonging needs and social sensitivity. They found that those who feel a high need to socialize can sense and decode verbal and nonverbal social cues more easily than those who have comparatively low belonging needs. Advanced technologies are often featured with social cues. For instance, a virtual character uses facial expressions and language which are very common sources of social information (Pickett et al., 2004). Therefore, people who are particularly attuned to social cues due to their high level of need to belong may display a readiness to gain social satisfaction via advanced technology – if this technology is able to provide believable social cues.

### *2.3. Virtual rapport and the role of nonverbal behavior*

Having a good conversation satisfies people's belonging needs. But how exactly do people define a good conversation? A flowing interaction is marked by harmony and synchrony; in social psychology this is often referred to as rapport. Rapport is said to have positive influences in “negotiations, management, psychotherapy, teaching and caregiving” (Gratch et al., 2007a, p.1; also see Drolet & Morris, 2000). Tickle-Degnen and Rosenthal (1990) described three major components when defining rapport: mutual attention, positivity and coordination. According to that, rapport occurs on three levels. On the behavioral level, both interaction partners align their body movements (e.g. posture shifts, nods), on the emotional level, both conversation partners feel comfortable and perceive the interaction as rewarding. Finally, on the cognitive level there is a shared understanding (Tickle-Degnen & Rosenthal, 1990; Gratch, et al., 2007a). Rapport is a sign of quality within an interaction and does not arise in every interpersonal conversation. When rapport occurs, people are more responsive to what the counterpart is saying, broaden their variety of topics, keep more eye-contact, smile more frequently and increase proximity (Grahe & Bernieri, 1999; Cassell, Gill, & Tepper, 2007), showing that rapport happens both on a verbal and on a nonverbal level. However, some researchers (Grahe & Bernieri, 1999; Tickle-Degnen & Rosenthal, 1990) argue that nonverbal cues are more essential indicators (and drivers) for rapport. For example, Grahe and Bernieri (1999) found that people assessed rapport (operationalized as mutual liking) more accurately when nonverbal cues were accessible. Overall, rapport can be viewed as a phenomenon with two different

characteristics: instant liking and responsiveness, as well as an increasing interdependence over time (Cassell et al., 2007). Therefore, Cassell and colleagues (2007) distinguished between short-term and long-term rapport. Whereas short-term rapport demands all three components (mutual attention, positivity and coordination) to the same extent, long-term rapport differs. They proposed that when a relationship deepens, positivity becomes less important, coordination increases while mutual attention remains at the same level (Cassell et al., 2007). This study focuses on short-term rapport, instant liking and responsiveness.

Research on Embodied Conversational Agents (ECAs) has shown that virtual humans can be a useful tool to establish rapport within a conversation (Maatman et al., 2005; Gratch et al., 2006; Huang et al., 2011). The Rapport Agent, developed by Gratch et al. (2006), can produce listening behaviors and has been shown to have an effect on human's social behaviors. In order to encourage the human story teller to continue talking, the Rapport Agent is – amongst other features - equipped with so called backchannel continuers (e.g. head nods) (Gratch et al., 2007a). The agent perceives the speaker's upper body movements and therefore generates appropriate head nods as a response to what the speaker is saying. Additionally, the agent displays a broad set of nonverbal behaviors such as eye-blinking, different posture shifts and smiling. Empirical research has shown that these are the most important cues which help to establish rapport between two interaction partners (Grahe & Bernieri, 1999; Huang et al., 2011). By analyzing the human user's body movements in real time (disfluency of speech, smiles, head nods), the behavior of the virtual human can be produced as contingent responsive behavior (Gratch et al., 2007a). The Rapport Agent therefore not only displays evident social cues such as vocal tone and facial expressions but also provides interaction abilities which might render it a rewarding conversation partner. Thus, social responsive behaviors and subsequent rapport within a human-machine dialogue may help to increase social satisfaction, which is an integral part of the current research.

#### *2.4. The present research and hypotheses*

The goal of the present study is to explore to what extent conversations with virtual agents can satisfy social needs in the sense of “social snacks” described by Gardner et al. (2005). As crucial influencing factors, we have described people's individual need to belong as well as the quality of the interaction in the sense of the socially responsive behavior shown. Therefore, we aim at contributing to a more complete understanding of whether a human-computer interaction can provide rapport that satisfies one's need for social contact and to what degree this is dependent on one's individual need to belong.

The Rapport Agent is designed to establish rapport in the sense of mutual liking, increased responsiveness and positivity between itself and the user by displaying contingent nonverbal behaviors. Subsequently, when the virtual counterpart displays social responsive behavior, it should be perceived as conveying more rapport and should be rated as closer (e.g. mutual liking). Therefore, the following hypotheses can be formulated:

Hypothesis 1: The agent in the socially responsive condition is perceived to convey greater rapport than the agent in the control condition.

Hypothesis 2: The agent in the socially responsive condition leads to more perceived connectedness than the agent in the control condition.

Since the quality of interactions in terms of responsiveness and positivity have been described to be associated with satisfying one's need for social contact (Baumeister & Leary, 1995), it can be assumed that only when the agent conveys rapport, there is the possibility to contribute to the satisfaction of the momentary need for social contact.

Hypothesis 3: After interacting with the agent in the socially responsive condition, participants feel less willingness to engage in further interaction compared to after interacting with the agent in the control condition.

Likewise, based on the fundamental attributes of the need to belong described by Baumeister and Leary (1995) as well as of the description of the need to belong as an individual trait (Leary et al.,

2005) it can be assumed that the higher people's need to belong is, the more will they strive for any kind of further social interaction.

Hypothesis 4: Participants with more individual need to belong will have more willingness to engage in further interaction after talking to the virtual agent compared to those with lower need to belong.

As described above, people with a high need to belong have an increased willingness to socialize with others. But especially because of their increased need for interaction, they might also be open for satisfying their need by a “social snack” (Gardner et al., 2005). However, at the same time, not every social cue might be able to provide a “social snack” – for example, merely showing a picture of a virtual agent or merely providing a non-responsive agent may not be sufficient. People will only reach satisfaction with the interaction and consider the agent as a “social snack” if a minimum of reciprocity and positivity is given (if the agent displays socially responsive behavior). Therefore, we assume that – for people high in need to belong - the interaction with the virtual agent can only satisfy social needs (and serve as social snack) when the agent is responsive.

Hypothesis 5: There is an interaction of need to belong and the socially responsive behavior of the agent: Only when the agent is socially responsive, people with high need to belong will experience a decrease in willingness to engage in further social activities.

Finally, the satisfaction with the interaction with the agent might be assessed by inquiring for behavioral intentions, namely the willingness for further interactions with the virtual agent. Accordingly, we ask:

RQ: Which interaction partner (virtual agent, fellow human, alone) is preferred for a follow-up task and to what extent is the decision dependent on people's individual need to belong and the agent's socially responsive behavior?

### 3. Method

#### 3.1. Participants

A total of 79 participants (men = 38, women = 41) were recruited from the Greater Los Angeles Area. The recruitment was conducted via the online platform Craigslist.com and appointments were administered by the scheduling tool Acuityscheduling.com. People aged 18 to 70 were eligible; the age range was from 18 to 66 ( $M = 35.26$ ,  $SD = 12.38$ ). All participants signed a consent form in order to take part in the study. Exclusion criteria were subjective impaired vision and non-English speakers.

#### 3.2. Design

The participants were randomly assigned either to the experimental or control condition. 40 people interacted with the virtual human in the socially responsive behavior condition in which the agent displayed nonverbal feedback such as head nods and smiles. The remaining number of participants ( $N = 39$ ) was assigned to the control group using the virtual human that did not show any kind of feedback but merely slight and randomized posture shifts and eye blinking in order to appear alive (idle behavior).

#### 3.3. Procedure

Upon entering the lab, participants were instructed and asked to sign a consent form. All participants had to fill out several questionnaires about their personality before the interaction with the Rapport Agent started. They were informed that they would interact with an autonomous virtual human. However in fact, the agent only partly acted autonomously. The questions it posed were triggered by a Wizard-of-Oz procedure in which the agent was controlled by a human who started the next question at the appropriate time (Dahlbäck et al., 1993). Participants used a 30 inch screen to complete the online survey and interact with the virtual human, they were also provided with a headset in order to talk to the virtual agent and a keyboard and a computer mouse to answer the questionnaires. There were two webcams and one HD-camera installed facing the participants.

Participants were randomly assigned to one of the two conditions. During the interaction, the virtual human asked the participant five questions of increasing intimacy. In order to facilitate the

answers, the agent started out by telling something about itself (see Nass & Moon, 2000; von der Pütten et al., 2010). The questions were:

- 1) I was designed and built by ICT researchers here in Marina del Rey. What is your hometown?
- 2) When I don't interact with people, I usually study them so I can better communicate with them.

What are your favorite things to do in your free time?

- 3) I like to listen to what people say. I have lots of patience for listening, even if you have a lot to say. What characteristics of yourself are you most proud of?

- 4) I feel furious when people treat me as if I was just a machine without any thinking or feeling. What are some of the things that make you furious?

- 5) My abilities are somewhat limited. For example, I can speak and listen to what you say, but I can't walk down a street in your world. What are some of the things you hate about yourself?

Afterwards, all participants filled out post-questionnaires, which comprised the evaluation of the agent and the interaction and an assessment of people's need to reach out to others. During the experiment the instructor remained in an adjacent room monitoring the participants via video camera. After completing the questionnaires, the instructor re- entered the room and posed one last question (who to play a follow-up game with). Each session lasted approximately 35 minutes. Afterwards, participants were fully debriefed and then they received \$25 as compensation.

#### 3.4. *The agent*

The agent was used as a listener in the dyadic conversation set-up. The agent attempts to establish rapport during the conversation by displaying continuous nonverbal feedback (see Gratch et al., 2007b). For the purpose of this study and in order to be able to generalize the results to different appearances, two (female) representations of the agent were used. Both agents were used in both conditions (see Fig. 1).



Fig. 1. Appearance of the virtual agents employed in the study.

The version used for this study was the second – modified – version of the agent. In the first version, the agent acted as a silent but attentive agent. It was later extended to an interview-like setting where the agent used pre-recorded questions to establish a conversation, similar to the setting at hand (Huang et al., 2011). In order to create rapport within a dyadic conversation, attention and coordination of nonverbal cues are crucial. Head nods, smiling and posture shifts represent indicators for rapport during the conversation. The agent is able to detect these indicators and then tries to replicate the participants' behavior by giving contingent nonverbal feedback (Wang & Gratch, 2009). By doing so, the agent follows a set of rules derived from social science literature. Huang et al. (2011) enhanced the agent's accuracy in giving feedback and developed a modified version of the agent

(Huang et al., 2011). The modified system architecture consists of three main components: 1) perception, 2) response and 3) visualization..

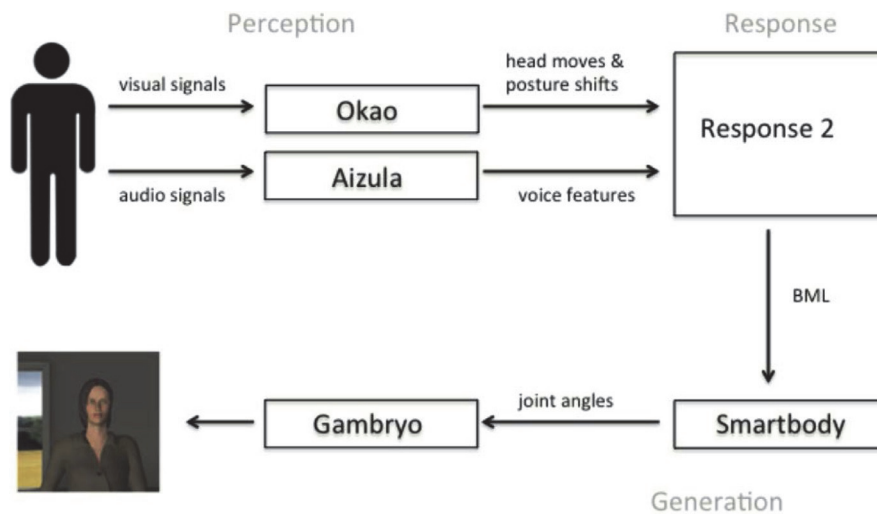


Fig. 2. Architecture of the rapport agent.

The perception component collects and analyzes audiovisual data - the participants' upper-body movement and voice - in real-time. In order to detect all audiovisual features the agent uses two different software packages: Okao and Aizula. Okao detects visual features such as head nods, the position and orientation of the participants' head, eye-gaze (gaze drifts away or not) and the smile level (Huang et al., 2011). The software monitors the interviewees' upper-body movements and posture shifts. Aizula captures audio signal (speech and silence) and analyzes the pitch and intensity of the participants' speech. The recognized audiovisual signals are then sent to the response component (Kulms et al., 2011; Huang et al., 2011).

In the response component, the captured features are run through a set of feedback rules, which determine the agent's nonverbal reaction to what the participant is saying. The software recognizes speech, silence, smile and eye-gaze and then provides the appropriate backchannel feed-back.

As a next step, the output from the response component is transferred to an animation system using Behavioral Markup Language (BML). The output determines the virtual human's reaction. The animation system, Smartbody (Thiebaut et al., 2008), guarantees a coherent dyadic conversation by alternating active and passive behavior. After that, the animated feedback is rendered by Gambryo, a commercial game engine, and displayed on the screen (Gratch et al., 2006; Huang et al., 2011) (see Fig. 3). In the interactions during the experiment, the agent in the socially responsive condition on average smiled 17.25 (SD = 18.93) times and nodded 14.43 (SD = 8.97) times.

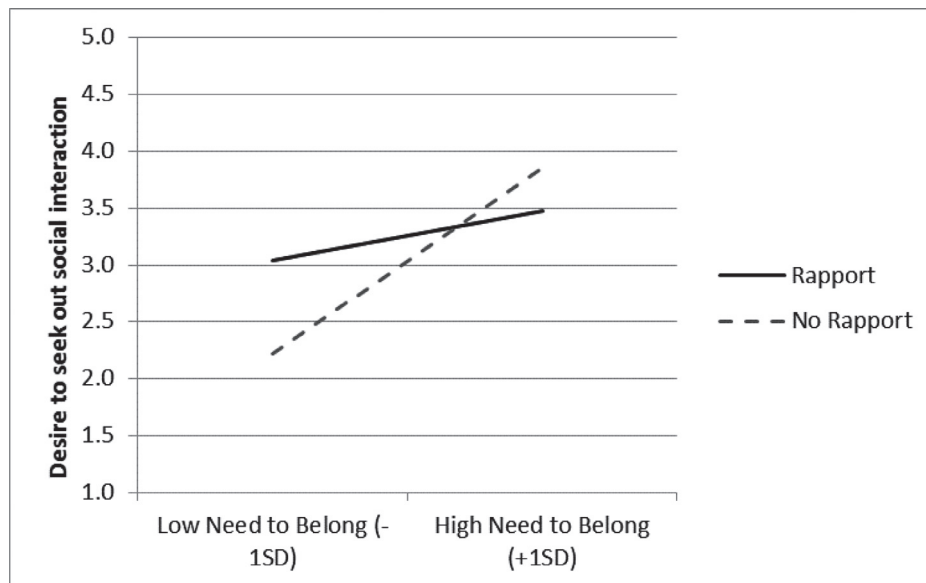


Fig. 3. Simple slopes of the interaction of need to belong and rapport condition.

## 4. Measures

### 4.1. Dependent variables

**Perception of the agent.** In order to measure people's perception of the agent, the participants were asked to fill in two post-questionnaires. First, the Rapport Scale (Kang & Gratch, 2012) with 23 items was used in order to assess how participants perceived the interaction and the Rapport Agent per se (e.g., "I felt I had a connection with the listener"; "The interaction was frustrating"; "The listener's body language encouraged me to continue talking"). People were asked to evaluate the interaction on a 7-point Likert scale (very strongly disagree – very strongly agree). In order to conduct further analysis the 23 items were all combined into one variable (Cronbach's  $\alpha = .92$ ,  $M = 4.24$ ,  $SD = .855$ ).

Secondly, parts of the Social Connectedness questionnaire (van Bel et al., 2009) were employed. The questionnaire developed by van Bel et al. (2009) consists of two parts: the Specific Connectedness Dimension and the Overall Connectedness Dimension. For this study 14 of 18 items from the Specific Connectedness Dimension (2. Dissatisfaction with contact quality, 3. Shared understandings, 4. Knowing each other's experiences, 5. Feeling of closeness) were used with a 5-point Likert scale (strongly disagree – strongly agree). Relationship salience was excluded since the participants did not interact with the Rapport Agent before. The items were slightly rephrased to adjust the measurement to human-machine interaction ("I derive little satisfaction from the contact with X" – "I derive little satisfaction from the contact with the virtual human"). The 14 items were all combined into one variable (Cronbach's  $\alpha = .91$ ,  $M = 2.53$ ,  $SD = .696$ ).

**Willingness to engage in social activities.** The study aims at demonstrating that virtual humans can satisfy people's need for social contact and therefore alleviate the need to engage in social activities. 18 items in total were developed in order to measure people's willingness to socialize after the interaction with the virtual human. The participants were asked to answer the items using a 5-point Likert scale (1 = very likely, 5 = very unlikely). A factor analysis was conducted on the 18 items with orthogonal rotation (varimax). The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis,  $KMO = .72$ . Bartlett's test of sphericity  $\chi^2(153) = 836.82$ ,  $p < .001$  indicating that the correlations were sufficiently large for Principle Components Analysis. An initial analysis was run to obtain eigenvalues for each component in the data. In total there were five components over Kaiser's criterion of 1. However, only the first two factors had good reliabilities and were retained in the final analysis explaining 48.38% of variance in combination. Table 1 shows the factor loading after rotation. The items that cluster on factor1 all describe the desire to engage in social activities with friends and family and can therefore be summarized as "desire". Due to

incompatibility in regards to the content, the item “I am going to call my friends today” was excluded from factor 1. Factor 2 represents people’s actual plans to socialize after the interaction and can be termed “plan”.

Table 1. Factor analysis of the items measuring willingness to socialize.

Item	desire	action
	Desire	Plan
Now I would like to meet my friends.	<b>.862</b>	-.177
Now I feel like calling my friends.	<b>.807</b>	
Now I feel like socializing.	<b>.781</b>	-.145
Now I would like to meet my family.	<b>.759</b>	-.230
Now I want to feel close to my friends.	<b>.750</b>	-.352
Now I want to feel close to my family.	<b>.745</b>	-.379
Now I feel like calling my family.	<b>.724</b>	
Now I feel like texting my friends.	<b>.662</b>	.196
Now I feel like texting my family.	<b>.607</b>	.142
I am going to meet my family today.		<b>.701</b>
I am going to text my family today.	.244	<b>.688</b>
I am going to text my friends today.	.384	<b>.642</b>
I am going to call my family today.	.439	<b>.552</b>
Eigenvalues	6.09	2.62
% of variance	33.85	14.53
$\alpha$	.91	.72

Behavioral intention. In addition to the ad hoc items, a behavioral measurement was used in order to assess the participants’ need for social contact. People were asked to join a follow-up game and had three options concerning the interaction partner to choose from. They could either chose to play (1) by themselves, (2) with the same virtual human they had already encountered, or (3) with another participant. The follow-up task offered the opportunity to incorporate a behavioral measurement in the study and thus broaden the variety of response options regarding the subjects’ need for social contact.

#### 4.2. Moderating variables

Need to belong. Personality traits might influence the effect that in- dependent variables have on the dependent variable. Therefore people’s individual need to belong was measured. In order to assess the participants’ urge to socially belong, a Need to Belong Scale comprising 10 items was used (e.g., “Social bonds are important to me”; “I do not like being alone”) (Krämer et al., 2013a). The participants were asked to fill out the questionnaire on a 5-point Likert scale (from 1 = strongly disagree to 5 = strongly agree). In order to conduct further analysis, the 10 items were all combined into one variable (Cronbach’s  $\alpha$  = .69,  $M$  = 3.47,  $SD$  = .489).

## 5. Results

Before testing the hypothesis we explored the descriptive values of need to belong scale in the two conditions. A t-test revealed there was a significant difference in need to belong between control ( $M$  = 15.90,  $SD$  = 1.77) and socially responsive ( $M$  = 14.55,  $SD$  = 2.93) conditions ( $t(77)$  = 2.47,  $p$  = .02). While one might argue that the lower need to belong observed in the socially responsive condition indicates range restriction (e.g., floor effect), which could lead to a lack of an effect of need to belong (on plans to seek out others), the fact that there is actually a \*larger\* standard deviation for need to belong in that condition rules out that possibility.

Although it was expected in H1 that participants would report experiencing greater rapport with the socially responsive agent in comparison to the agent without socially responsive behavior, there was no difference between these conditions ( $M$  = 4.20,  $SD$  = .89 vs  $M$  = 4.27,  $SD$  = .82,  $t(77)$  = .34,  $p$



= .74). Likewise, participants did not report greater connectedness with the agent in the socially responsive condition than in the socially non-responsive condition ( $M = 2.51$ ,  $SD = .72$  vs  $M = 2.54$ ,  $SD = .68$ ,  $t(77) = .21$ ,  $p = .83$ ). Therefore, hypotheses 1 and 2 were not supported. Additionally, t-tests did not reveal significant differences between the socially responsive condition and the socially non-responsive condition in “desire” ( $M = 3.24$ ,  $SD = .83$  vs  $M = 3.36$ ,  $SD = .83$ ,  $t(77) = .66$ ,  $p = .51$ ) nor in “plan” ( $M = 3.20$ ,  $SD = .95$  vs  $M = 3.26$ ,  $SD = 1.05$ ,  $t(77) = .25$ ,  $p = .80$ ). Thus, there is no evidence that the quality of the interaction affects people’s willingness to engage in further social contact. Therefore, H3 was not supported.

In order to demonstrate that virtual agents who engage in rapport- building behaviors can serve as social snacks, reducing the willingness to engage in social activities among those who have a strong need to belong, moderated regression analyses were performed on both the “desire” and “plan” variables.

First, to analyze “desire”, we conducted a regression analysis predicting state levels of desire to seek out social interaction by entering trait need to belong (centered) in first step, adding condition (dummy-coded: 0 = socially non-responsive agent, 1 = socially responsive agent) in a second step, followed by adding the need to belong  $\times$  condition interaction term in a third step. As expected, chronic need to belong predicted immediate desire to seek out social interaction ( $\beta = .38$ ,  $t(76) = 3.61$ ,  $p = .001$ ), and there was no need to belong by condition interaction ( $\beta = -.05$ ,  $t(75) = -.49$ ,  $p = .63$ ).

To analyze “plan”, we conducted another regression analysis predicting state levels of plan to seek out social interaction by entering trait need to belong (centered) in a first step, adding condition (dummy-coded: 0 = socially non-responsive agent, 1 = socially responsive agent) in a second step, followed by adding the need to belong  $\times$  condition interaction term in a third step. While chronic need to belong predicted the plan to seek out social interaction as expected ( $\beta = .36$ ,  $t(76) = 3.36$ ,  $p = .001$ ), there was a need to belong by condition interaction ( $\beta = -.51$ ,  $t(75) = -2.49$ ,  $p = .02$ ). Likewise, a 95% confidence interval for  $\beta$  includes 0, as it ranges from  $-.004$  to  $.436$ . As can be seen in Fig. 3, follow-up simple slope analyses within each condition revealed that, after interacting with an agent that was not designed to display socially responsive behavior, participants with a heightened need to belong have a much stronger plan to reach out to others eminently ( $\beta = .82$ ,  $t(75) = 3.94$ ,  $p < .001$ ). However, interacting with an agent that engages in socially responsive behaviors provided a social snack, as those with a stronger need to belong were less planning to seek out social interaction after interacting with the socially responsive agent ( $\beta = .22$ ,  $t(76) = 1.73$ ,  $p = .09$ ). Therefore, in sum, H4 was supported since our data show that people with increased need to belong had an increased need to seek out further interaction after the conversation with the virtual agent (independent of the condition). Also, we find support for H5 since people with a high need to belong were less planning for further social contact after the interaction with the agent that displays socially responsive behavior compared to an interaction with an agent not showing socially responsive behavior.

With regard to the decision with whom to play an alleged game, descriptive data show that 57% of all participants chose to play the follow-up game with the virtual human as a partner. 29.1% opted for another participant and only 13.9% decided to play by themselves. People’s decision was regardless of the condition in which they were interacting with the agent. A regression analysis shows that need to belong also did not influence the decision with whom to play. Therefore, it can be summarized that people in general valued the interaction with the virtual agent so that more than half of the participants opted to continue the interaction. However, this was neither affected by condition (thus, the socially responsive agent was not chosen more frequently) nor by people’s individual need to belong.

## 6. Discussion

The present study aimed at investigating whether virtual humans can satisfy one’s need for social contact. As previous findings indicated, a minimal set of human-like cues is sufficient to encourage people to engage in social dialog and can also be found in human-machine interaction (Pickett et al., 2004). For instance, if virtual characters feature social cues such as language or facial expressions and

have basic dialogue abilities, it was assumed that they can serve as means for social satisfaction – at least in the sense of providing a “social snack” as defined by Gardner et al. (2005). Hence, this study explored whether a virtual human, specifically the Rapport Agent when showing socially responsive behavior, is capable of satisfying people’s need for social contact depending on their individual need to belong. Therefore, two different versions of the Rapport Agent were employed: one that displayed socially responsive, contingent nonverbal behavior (smiling and nodding), which is assumed to enhance social effects during a dialog, and one version that exhibited only verbal cues and basic idle nonverbal behavior. With regard to people’s perception of the agent, the results showed that the evaluation in terms of rapport and perceived connectedness to the agent did not depend on the condition (socially responsive condition vs. control condition) that the participants were assigned to. The participants rated the agent’s performance and connectedness irrespectively of the nonverbal behavior display. The results did not confirm Gratch et al.’s (2007b) findings that nonverbal behavior of a virtual character influences people’s perception and experience.

Usually, rapport within a dialog is seen as an indicator for good conversation quality and is associated with increased mutual liking (Tickle-Degnen & Rosenthal, 1990). As Grahe and Bernieri (1999) pointed out, the nonverbal component is crucial when establishing rapport among the conversation partners. The Rapport Agent does feature a wide range of nonverbal feedback such as diverse head nods, eye blinking, posture shifts and smiling, which has been shown to be sufficient to produce increased evaluation and social behaviors (Gratch et al., 2006; Huang et al., 2011; von der Pütten et al., 2010). A lot of research regarding the establishment of rapport during human-agent interaction focuses on short-term rapport (instant liking) (Maatman et al., 2005; Gratch et al., 2006). While it is not clear whether long-term rapport can be established by technology, the perception of short-term rapport has been demonstrated and therefore was expected to emerge in this study. Since other studies have already shown effects of socially responsive behavior of the agent, it is difficult to explain why there was no main effect on perception of rapport and of connectedness here.

One potential explanation to be considered is that other studies tended to show more pronounced effects on participants’ behavior instead of participants’ perception and subjective experiences (Gratch et al., 2006; Huang et al., 2011; von der Pütten et al., 2010). Therefore, socially responsive behavior seems to have the potential to be influential even without people consciously noticing it – and this was also true in our study: with regard to the factor “plan”, socially responsive behavior impacted future behavioral plans (moderated by the need to belong trait) although these same participants do not describe rapport and an increased connection. Although there was no main effect of the socially responsive condition on the willingness to engage in social contact, it became evident that especially for people with a high need to belong, the plan for future social contact on the same day is diminished only after having had a high-quality, socially responsive interaction with a virtual agent.

Another plausible explanation might be that in the specific interview and conversation situation in our study, there was little opportunity for the agent to display rapport behavior. Since the agent’s behavior is contingent to the participant’s behavior the agent would not show a lot of rapport behavior if the participant did not display much nonverbal behavior. However, the fact that the agent showed on average 17 smiles per interaction would speak against this assumption.

Additionally, the Rapport Agent produces its nonverbal feedback without attending to the verbal content of the participant’s comments, which can lead to faulty feedback (Gratch et al., 2007a). In order to propel mutual understanding, it is crucial to give specific responses to what the counterpart is saying. Faulty nonverbal responses that the agent displays can be highly inappropriate in some cases. For instance, in the present study one of the questions asked by the Rapport Agent broached the issue of what makes the participant furious. Smiling as a response can be detrimental in this case – even if the smiling is a reaction to the participants’ smiling. Summing up, therefore, the present context-free feedback could have led to frustration with the agent, as the user might have felt misunderstood. However, the follow-up questions show that there is no general disappointment or frustration with the agent since more than half of the participants chose to continue their conversation with the agent.

With regard to main effects of personality traits, it was tested whether people's individual need to belong (Leary et al., 2005; Kelly, 2001; Krämer et al., 2013a) would affect the willingness to engage in future social interaction. Here, it was indeed shown that need to belong predicts whether people wish to engage in social contact after the interaction with the virtual agent and whether they would initiate actual social meetings (e.g. phoning friends, meeting family). Given the definition and measure of the need to belong trait which includes the tendency to affiliate with others (Baumeister & Leary, 1995; Krämer et al., 2013a), this finding is not surprising.

More astonishing and the most important finding of our study is that for people with a high need to belong, the interaction with a virtual agent can indeed diminish their plan to engage in social contact, but this is true only when the agent displays socially responsive behavior. In sum, when people interact with a virtual agent, a higher need to belong is associated with more plans to talk with other people, but not if the virtual agent itself provides social "treats" by smiling and nodding. Therefore, a minimum of reciprocity and positivity (Tickle-Degnen & Rosenthal, 1990) is necessary in order to reach sufficient satisfaction with the situation so that further social interaction is rendered less important. An explanation for why people with a high need to belong respond to agent's socially responsive behavior can be derived from previous results: according to Appel et al. (2012) people who have a high need to belong have a higher disposition to decode social cues in order to satisfy their social needs. As outlined earlier, socially responsive behavior within a dialog enhances mutual liking and is assumed to be an indicator for conversation quality. Hence, the occurrence of socially responsive behavior is proposed to deliver a higher social satisfaction caused by the Rapport Agent's performance. A high number of social cues are expected to elicit more social behavior leading to rapport and consequently lead to a more fertile dialog (Appel et al., 2012). The Rapport Agent displays a variety of social cues, however, human-human conversation is a complex matter that cannot be itemized in a specific amount of behavioral actions that easily – which might be a reason for why the socially responsive behavior did not yield a main effect (see above).

At the same time it needs to be acknowledged that people with lower need to belong (who do not seem to be too keen on contact anyway) are more stimulated to seek our social contact when the agent shows rapport.

Another aspect that needs to be discussed is why the effect is only significant for the factor "plan" which is just one of the factors of the willingness to engage in social activities. As the plans to engage in social activities include activities which might not easily be susceptible to influences by social interactions with agents (such as "meeting with family"), this is even a more demanding test.

In sum, we conclude that for a specific group of users and when a minimum quality of the conversation is given, people indeed can benefit from virtual agents in the sense that they experience "social snacking" in terms of a decrease of their momentary plan to engage in social contact. Does this mean, that in 50 years, people will engage not only in social snacking but will satisfy their belongingness needs by conversing with their virtual companions instead of real world human friends and acquaintances? The history of media psychology suggests that this will not be the case: so far, neither cinema, TV, computer games or the Internet's social networking sites have led to what was feared: the destruction of human relations and the end of meeting friends face-to-face. Therefore, this should not be expected to occur with regard to interactions with artificial entities. In line with this, socially responsive agents will probably also never be a means to resolve loneliness. Still, such interactions with socially responsive agents could – like other social snacking (looking at photographs of loved ones) – be helpful in bridging the time until human social contact will be possible. With regard to the future design of virtual agents, designers might derive from the present results that agents need to be socially responsive at least to a minimum extent so that people with a high need to belong trait can benefit from interactions with them.

#### *6.1. Limitations and future research*

Several methodical aspects concerning the measurement and scenarios used in the present study have to be reviewed critically, in order to better understand the findings obtained in the hypotheses testing.

As already alluded to above, there could have been too little opportunity in the short conversation to display rapport behavior. Especially as the agent's behavior is contingent to the participant's behavior, there might have been dyads in which only a small amount of smiling and nodding became visible. Future studies should therefore take care that the socially responsive and socially not-responsive condition differ considerably.

Another concern is the fact that standardized scales could not be used comprehensively. While for need to belong trait (Krämer et al., 2013a), rapport (Gratch et al., 2007) and social connectedness state (van Bel et al., 2009), instruments whose reliability, validity and usefulness have been demonstrated, were used, there was no measure for assessing the momentary willingness to engage in social contact. Therefore, we were only able to use items which we specifically developed for the study. These items obtained solid reliability but nevertheless one might argue that the measure has not yet been tested extensively for reliability and validity.

The conducted study was limited to rather short conversations. It can be derived from the questionnaires and debriefings, that the participants experienced the interaction to be too short and the majority expressed disappointment regarding the length of conversation. Specifically, the conversation with the Rapport Agent entailed only five questions in total; many participants reported that the conversation ended, just in that moment they opened up to the virtual human. Therefore, it could be argued that five questions are not sufficient in order to encourage people in social dialog and further questions should be added. This observation suggests that a long-term interaction with the Rapport Agent can eventually advance social satisfaction.

Moreover, according to Baumeister and Leary (1995) social satisfaction can be achieved through social dialog that implies positivity, mutual affection, and occurs repeatedly. As the study set-up entailed only one interaction session, not all requirements of potential social satisfaction were met. There are findings that suggest that repeated human-agent interaction can elicit pleasant anticipation to the next interaction and concomitantly positive emotions (Bickmore, 2004). Therefore, future studies should employ a long-term design.

With regard to the appearance of the agents, several aspects require critique. First, virtual characters that resemble the user are assessed more positive (Iacobelli & Cassell, 2007), and as an "in-group" member, the agent is perceived as more intelligent and competent – even when it has the same narratives as a virtual character that does not resemble the user (Nass et al., 2000). The participants of the current study were of different ethnic groups, however not all ethnicities were considered in the current research design. Additionally, only female characters were employed, which also could influence the participant's evaluation, as half of the sample was male. It could be helpful for future studies to employ diverse virtual characters matching participants' ethnicity and gender.

Although the current research showed some effects, it is not clear yet, how valuable the interaction with a socially responsive agent as a social snack is, compared to other potential social snacks such as watching a TV-series featuring a favorite protagonist or reading one's Facebook feed. Therefore, future studies should employ similar experimental procedures in which a socially responsive agent is compared with other sorts of potential social snacks.

## 7. Conclusion

In conclusion, although there was no main effect of the agent's socially responsive behavior on participants' experiences of rapport and connectedness, it is all the more important that the interaction between need to belong trait and socially responsive behavior yielded significant results. While it seems obvious that the need to belong is directly related to the willingness to engage in social contact, it is important to note that this need cannot be satisfied by presenting a human-computer interaction with any kind of social cues. For despite social cues such as human-like appearance, verbal cues (speech) and basic nonverbal idle behaviors, the plan to engage in social interaction after the conversation with the virtual agent was only significantly smaller when the agent showed social qualities like socially responsive behavior - in the sense of smiling and nodding while listening.

Therefore, the reciprocity and positivity which are conveyed by socially responsive behaviors are essential when trying to provide people with “social snacks”.

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## References

- Appel, J., von der Pütten, A.M., Krämer, N.C., Gratch, J., 2012. Does humanity matter? Analyzing the importance of social cues and perceived agency of a computer system for the emergence of social reactions during human-computer interaction. *Adv. Hum.- Comput. Interact.* doi:10.1155/2012/324694.
- Baumeister, R.F., Leary, M.R., 1995. The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychol. Bull.* 117, 497–529. doi:10.1037//0033-2909.117.3.497.
- Bickmore, T., Cassell, J., 2005. Social dialogue with embodied conversational agents. In: van Kuppevelt, J.C.J., Dybkjær, L., Bernsen, N.O. (Eds.), *Advances in Natural Multimodal Dialogue Systems*. Springer, Netherlands, pp. 23–54. Retrieved from [http://link.springer.com/chapter/10.1007/1-4020-3933-6\\_2](http://link.springer.com/chapter/10.1007/1-4020-3933-6_2).
- Bickmore, T.W., 2004. Unspoken rules of spoken interaction. *Commun. ACM* 47 (4), 38–44.
- Cacioppo, J.T., Hawkley, L.C., 2009. Perceived social isolation and cognition. *Trends Cognit. Sci.* 13 (10), 447–454. doi:10.1016/j.tics.2009.06.005.
- Cacioppo, J.T., Patrick, W., 2009. *Loneliness: Human Nature and the Need for Social Connection*. W. W. Norton & Company.
- Cassell, J., Bickmore, T., Vilhjálmsón, H., Yan, H., 2000, January. More than just a pretty face: affordances of embodiment. In: *Proceedings of the 5th international conference on Intelligent user interfaces*. ACM, pp. 52–59.
- Cassell, J., Gill, A., Tepper, P., 2007. Coordination in Conversation and Rapport. In: *Proceedings of the Workshop on Embodied Natural Language, Association for Computational Linguistics*. June 24–29. Prague, CZ.
- Dahlbäck, N., Jönsson, A., Ahrenberg, L., 1993. Wizard of Oz studies—why and how. *Knowl.-Based Syst.* 6 (4), 258–266.
- Drolet, A.L., Morris, M.W., 2000. Rapport in conflict resolution: accounting for how face-to-face contact fosters mutual cooperation in mixed-motive conflicts. *J. Exp. Soc. Psychol.* 36 (1), 26–50. doi:10.1006/jesp.1999.1395.
- Fogg, B.J., Nass, C., 1997. Silicon sycophants: the effects of computers that flatter. *Int. J. Hum.-Comput. Stud.* 46 (5), 551–561. doi:10.1006/ijhc.1996.0104.
- Gardner, W.L., Pickett, C.L., Knowles, M., 2005. Social snacking and shielding. In: Williams, K.D., Forgas, J.P., von Hippel, W. (Eds.), *The Social Outcast: Ostracism, Social Exclusion, Rejection, and Bullying*. Psychology Press, New York, pp. 227–241. Grahe, J.E., Bernieri, F.J., 1999. The importance of nonverbal cues in judging rapport. *J. Nonverbal Behav.* 23 (4), 253–269. doi:10.1023/A:1021698725361.
- Gratch, J., Okhmatovskaia, A., Lamothe, F., Marsella, S., Morales, M., van der Werf, R.J., Morency, L.-P., 2006. Virtual rapport. In: Gratch, J. (Ed.), *Intelligent Virtual Agents*. Springer, Berlin, pp. 14–27. Retrieved from [http://link.springer.com/chapter/10.1007/11821830\\_2](http://link.springer.com/chapter/10.1007/11821830_2).
- Gratch, J., Wang, N., Gerten, J., Fast, E., Du, Y., R., 2007a. Creating rapport with virtual agents. In: Pelachaud, C., Martin, J.-C., André, E., Chollet, G., Karpouzis, K., Pelé, D. (Eds.), *Intelligent Virtual Agents*. Springer, Berlin, pp. 125–138. Retrieved from [http://link.springer.com/chapter/10.1007/978-3-540-74997-4\\_12](http://link.springer.com/chapter/10.1007/978-3-540-74997-4_12).
- Gratch, J., Wang, N., Okhmatovskaia, A., Lamothe, F., Morales, M., Werf, R.J., vander, Morency, L.-P., 2007b. Can virtual humans be more engaging than real ones? In: Jacko, J.A. (Ed.) *Human-Computer Interaction. HCI Intelligent Multimodal Interaction Environments*. Springer, Berlin, pp. 286–297. Retrieved from [http://link.springer.com/chapter/10.1007/978-3-540-73110-8\\_30](http://link.springer.com/chapter/10.1007/978-3-540-73110-8_30).
- Hoffmann, L., Krämer, N.C., Lam-chi, A., Kopp, S., 2009. Media equation revisited. Do users show polite reactions towards an embodied agent? In: Ruttkay, Z. (Ed.) *Intelligent Virtual Agents*. Springer, Berlin, pp. 159–165.
- House, J.S., Landis, K.R., Umberson, D., 1988. Social relationships and health. *Science* 241 (4865), 540–545.
- Huang, L., Morency, L.-P., Gratch, J., 2011. Virtual Rapport 2.0. In: Vilhjálmsón, H. Högni (Ed.), *Intelligent Virtual Agents*. Springer, Berlin, pp. 68–79.
- Iacobelli, F., Cassell, J., 2007. Ethnic identity and engagement in embodied conversational agents. In: Pelachaud, C., et al. (Eds.), *Intelligent Virtual Agents*. Springer, Berlin, pp. 57–63. Retrieved from [http://link.springer.com/chapter/10.1007/978-3-540-74997-4\\_6](http://link.springer.com/chapter/10.1007/978-3-540-74997-4_6).
- Kang, S.-H., Gratch, J., 2012. Socially anxious people reveal more personal information with virtual counselors that talk about themselves using intimate human back stories. In: *Annual Review of Cybertherapy and Telemedicine 2012: Advanced Technologies in the Behavioral, Social and Neurosciences*, 181, p. 202.
- Kappas, A., 2005. My happy vacuum cleaner. Paper presented at the ISRE General Meeting, Symposium on Artificial Emotions, July 2005.
- Kelly, K.M., 2001. Individual differences in reactions to rejection. *Interpersonal Rejection* 291–315.
- Kiesler, S., Sproull, L., Waters, K., 1996. A prisoner’s dilemma experiment on cooperation with people and human-like computers. *J. Pers. Soc. Psychol.* 70, 47–65. doi:10.1037/0022-3514.70.1.47.
- Kopp, S., Rieser, H., Wachsmuth, I., Bergmann, K., Lücking, A., 2007. Speech-gesture alignment. Paper presented at the 3rd Conference of the International Society for Gesture Studies.
- Krämer, N.C., 2005. Social communicative effects of a virtual program guide. In: Panayiotopoulos, T. (Ed.), *Intelligent Virtual Agents 2005*. Springer, Hamburg, pp. 442–543.
- Krämer, N.C., Hoffmann, L., Eimler, S., Fuchslocher, A., Szczuka, J., Klatt, J., Sträfling, N., Lam-chi, A., Brand, M., 2013a. Do I need to belong? Development of a scale for measuring the need to belong and its predictive value for media usage. Paper at the annual meeting of the International Communication Association, London, June 2013.
- Krämer, N., Kopp, S., Becker-Asano, C., Sommer, N., 2013b. Smile and the world will smile with you – The effects of a virtual agent’s smile on users’ evaluation and behavior. *Int. J. Hum.-Comput. Stud.* 71 (3), 335–349. doi:10.1016/j.ijhcs.2012.09.006.
- Kulms, P., Krämer, N.C., Gratch, J., Kang, S.-H., 2011. It’s in their eyes: A study on female and male virtual humans’ gaze. In: Vilhjálmsón, H.H., Kopp, S., Marsella, S., Thórisson, K.R. (Eds.), *Intelligent Virtual Agents*. Springer, Berlin, pp. 80–92. Retrieved from [http://link.springer.com/chapter/10.1007/978-3-642-23974-8\\_9](http://link.springer.com/chapter/10.1007/978-3-642-23974-8_9).
- Leary, M.R., Kelly, K.M., Cottrell, C.A., Schreindorfer, L.S., 2005. Individual differences in the need to belong. Unpublished Manuscript. Wake Forest University.

30. Maatman, R.M., Gratch, J., Marsella, S., 2005. Natural behavior of a listening agent. In: Panayiotopoulos, T., Gratch, J., Aylett, R., Ballin, D., Olivier, P., Rist, T. (Eds.), *Intelligent Virtual Agents*. Springer, Berlin, pp. 25–36. Retrieved from [http://link.springer.com/chapter/10.1007/11550617\\_3](http://link.springer.com/chapter/10.1007/11550617_3).
31. Miller, L.C., Marsella, S., Dey, T., Appleby, P.R., Christensen, J.L., Klatt, J., Read, S.J., 2011. Socially optimized learning in virtual environments (SOLVE). In: *Interactive Storytelling*. Springer, Berlin, pp. 182–192. Retrieved from [http://link.springer.com/chapter/10.1007/978-3-642-25289-1\\_20](http://link.springer.com/chapter/10.1007/978-3-642-25289-1_20).
32. Nass, C., Isbister, K., Lee, E.-J., 2000. Truth is beauty: researching embodied conversational agents. In: Cassell, J., Sullivan, J., Prevost, S., Churchill, E. (Eds.), *Embodied Conversational Agents*. MIT Press, Cambridge, pp. 374–401.
33. Nass, C., Moon, Y., 2000. Machines and mindlessness: social responses to computers. *J. Soc. Issues* 56 (1), 81–103. doi:10.1111/0022-4537.00153.
34. Nass, C., Moon, Y., Green, N., 1997. Are machines gender neutral? gender-stereotypic responses to computers with voices. *J. Appl. Soc. Psychol.* 27 (10), 864–876. doi:10.1111/j.1559-1816.1997.tb00275.x.
35. Nass, C., Steuer, J., Tauber, E.R., 1994. Computers are social actors. In: Adelson, B., Du-mais, S., Olson, J. (Eds.), *Human Factors in Computing Systems: CHI'94 Conference Proceedings*. ACM Press, pp. 72–78.
36. Pickett, C.L., Gardner, W.L., Knowles, M., 2004. Getting a cue: the need to belong and enhanced sensitivity to social cues. *Pers. Soc. Psychol. Bull.* 30 (9), 1095–1107. doi:10.1177/0146167203262085.
37. Reeves, B., Nass, C., 1996. *The Media Equation - How People Treat Computers, Television, and New Media Like Real People and Places*. Cambridge University Press, Cambridge.
38. Shechtman, N., Horowitz, L.M., 2003, April. Media inequality in conversation: how people behave differently when interacting with computers and people. In: *Proceedings of the SIGCHI conference on Human factors in computing systems*. ACM, New York, pp. 281–288.
39. Thiebaux, M., Marsella, S., Marshall, A.N., Kallmann, M., 2008. SmartBody: behavior realization for embodied conversational agents. In: *Proceedings of the 7th international joint conference on Autonomous agents and multiagent systems - Volume 1*. SC: International Foundation for Autonomous Agents and Multiagent Systems, Richland, pp. 151–158. Retrieved from <http://dl.acm.org/citation.cfm?id=1402383.1402409>.
40. Tickle-Degnen, L., Rosenthal, R., 1990. The nature of rapport and its nonverbal correlates. *Psychol. Inquiry* 1 (4), 285–293.
41. Van Bel, D.T., Smolders, K., IJsselstein, W.A., de Kort, Y., 2009. Social connectedness: concept and measurement. In: *Intelligent Environments*, pp. 67–74. Retrieved from [http://www.researchgate.net/publication/220992602\\_Social\\_connectedness\\_concept\\_and\\_measurement/file/9fcfd5038a12628f67.pdf](http://www.researchgate.net/publication/220992602_Social_connectedness_concept_and_measurement/file/9fcfd5038a12628f67.pdf).
42. von der Puetten, A.M., Krämer, N.C., Gratch, J., Kang, S.-H., 2010. It doesn't matter what you are!" explaining social effects of agents and avatars. *Comput. Hum. Behav.* 26 (6), 1641–1650. doi:10.1016/j.chb.2010.06.012.
43. Wang, N., Gratch, J., 2009. Rapport and facial expression. In: *3rd International Conference on Affective Computing and Intelligent Interaction and Workshops*, 2009. ACII 2009, pp. 1–6. doi:10.1109/ACII.2009.5349514.

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#### **CONFLICT OF INTEREST STATEMENT**

NO

# Estimating the Value of the World Heritage Site Designation: a Case Study from Sagarmatha (Mount Everest) National Park, Nepal

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**Abstract.** It estimates the economic value of World Heritage Site (WHS) designation for the Sagarmatha (Mount Everest) National Park, Nepal. In 2012, entrance fees were \$30 per international visitor; lower fees apply to South Asian visitors, and no fees to domestic visitors. We surveyed 522 international visitors to the Park in 2011 to elicit their willingness to pay (WTP) for access, using the contingent valuation method. Logistic regression results show that bid amounts, gender, age, educational attainment, use of a guide, length of stay in the park, information about park substitutes, and knowledge about the park's WHS designation predicted visitors' WTP decisions. The median WTP amount was US\$90.93 per trip; 63.8% of visitors were willing to pay more than the existing entry fee. The revenue maximizing entry fee was \$80 per trip. Knowledge about the park's WHS designation prior to their trip contributed \$16.39 to the median WTP: better marketing of the site's WHS status could add up to US\$ 566, 619 to the site's annual income. Given that many protected areas now suffer falling public sector financial help, accurate knowledge of WTP is increasingly key to supporting sustainable management in WHS sites, and in justifying tourism to them.

**Keywords:** Contingent valuation; economic value; park entry fee; willingness to pay; World Heritage Site; visitor management.

## Introduction

The World Heritage Convention of 1972 is instrumental in protecting natural and cultural areas that are invaluable to humankind by including them on the World Heritage Site (WHS) list (UNESCO, 2014). To date, 165 countries are parties to the Convention, and 1052 sites fall under WHS designation worldwide. Of these, most (814) are cultural sites, while 203 are natural sites. The remainders (13) are mixed sites containing both cultural and natural amenities. Most natural sites are additionally protected within their countries as conventional protected areas, and the vast majority are national parks. The WHC is important in recognizing sites that are of unique international importance and its headquarters in the United Nations Education, Scientific and Cultural Organization (UNESCO) in Paris maintains a trust fund to aid developing countries in maintaining their WHSs ([whc.unesco.org/en/list](http://whc.unesco.org/en/list)). Countries are motivated to inscribe natural and cultural sites on the World Heritage List because listed sites often receive prestige, increased tourism, international cooperation, and financial assistance for conservation/preservation from the World Heritage Fund. As such, the World Heritage List itself can become a "brand" for marketing sites and attracting visitors (Heinen, 1995a; Ryan & Silvanto, 2009; Shackley, 1998) and WHS designation has substantially contributed

toward promoting tourism to listed sites (Frey & Steiner, 2011). An empirical analysis shows that the number of WHSs within a country is positively correlated with international tourist arrivals (Su & Lin, 2014).

The development of tourism in WHSs could be a boon or bane for several reasons. An increase in visitor numbers due to the WHS designation can positively influence employment creation and revenue generation (Heinen, 1995a; Nyaupane, Lew, & Tatsugawa, 2014) and, because the development of tourism requires good infrastructure and civil order, WHSs can promote development, build support for conservation and advance social harmony (Jha, 2005). On the other hand, tourism development can negatively affect conservation and protection of properties included on the World Heritage List (Batisse, 1992; Okech, 2010). For example, a 130-fold increase in tourist arrivals at the Jiuzhaigou WHS in China over a 30-year period has caused pollution and poses threats to biodiversity (Gu, Du, Tang, Qiao, Bossard, & Deng, 2013). This leads to two important questions: what is the economic value of the WHS designation to visitors and how can an understanding of this value improve the management of listed sites?

WHSs in the developing world frequently suffer from a lack of effective site management (Landorf, 2009) and, as a consequence, maintaining their unique characteristics might be difficult if not impossible (Alberts & Hazen, 2010). Although tourism contributes substantially toward revenue generation for managing protected areas, including WHSs (of WH natural sites), the vast majority are national parks and all are under some form of national protection (Heinen, 1995a), lack of adequate financial resources is one of the major reasons for ineffective management of protected areas in developing countries (Heinen, 2012). It is now well-accepted that protected area managers must devise alternative mechanisms to pay for the maintenance and protection of areas, including the concessions and other infrastructure used by tourists, given the global trend toward decreasing governmental budgets in the conservation sector (Whitelaw, King, & Tolkach, 2014). In a major review of research priorities regarding tourism in protected areas, Eagles (2014) discussed 10 separate issues of importance. Two of those, protected area financing and pricing policy, address budget issues directly. The other issues he discussed, such as assessing economic impacts, promoting public support and building professional competence in dealing with tourism, all require expanded budgets for their successful implementation.

While there is a growing literature on methods to capture rents in support of protected areas from indirect users in the form of carbon sequestration and other ecosystem services (Whitelaw et al., 2014), one of the easiest ways to increase protected area budgets is to increase direct user fees for those who visit (Heinen, 2010). Numerous studies worldwide have shown that there is a general acceptance of higher user fees for many protected areas in many contexts (e.g. Casey, Brown, & Schuhmann, 2010; Lee, Lee, Kim, & Mjelde, 2010), but such acceptance typically varies by any number of factors including the type of protected area, the average length of visit, the gender and age of respondents (see Kline, Cardenas, Duffy, & Swanson, 2012) and less tangible issues (for international tourists) such as the historical, economic, and political context of the society involved (Buckley, 2003).

For these reasons, instituting appropriate entry fees for sites that attract a large number of visitors is an effective way to generate adequate financial resources to mitigate some negative impacts of tourism. Increasing any positive impacts for the site and visitors alike, while reducing negative impacts of tourism are critical management goals in WHSs (Borges, Carbone, Bushell, & Jaeger, 2011). One way of achieving these goals is to identify and examine the willingness to pay (WTP) of visitors to visit any protected area. Additionally, those with WHS designation offer extra opportunities to study WTP in the context of the international designation. In all cases, information generated can be used to determine the extent of extra revenue generation with potentially increased entry fees in the future (e.g. Casey et al., 2010).

This study examines international visitors' WTP to visit Sagarmatha (Mount Everest) National Park, Nepal, which was inscribed on the World Heritage List in 1979 for its extraordinary scenery and geological features. Domestic visitors, or visitors from other Southeast Asian countries, are not considered here because they are relatively few in number and park entry fees are much lower for



them than for people from other parts of the world. Nepal has had a long history of adopting national policies and innovative strategies to foster conservation and manage its national parks and reserves and their surrounding buffer zones and community forests (Heinen & Rayamajhi, 2001; Timilsina & Heinen, 2008) and it is party to a number of international conservation agreements. But, as a least-developed country, Nepal is dependent on foreign aid for up to 80% of its development budget and has a history of facing strong barriers to implementing a number of national and international conservation policies, in part due to political unrest (Baral & Heinen, 2006), but mostly due to weak agencies and limited finances in the conservation sector. This has, for example, hindered the implementation of the Convention on International Trade in Endangered Species (CITES) within the country (Dongol & Heinen, 2012; Heinen, Yonzon, & Leisure, 1995) and its own national non-timber forest products policy (Shrestha-Acharya & Heinen, 2006).

There is increasing awareness worldwide about the importance of properly evaluating natural resources for national economies and considering ways to increase revenues to better manage natural areas and species (Barbier, 2014; Heinen, 1995b). Here we survey international visitors to Mount Everest National Park to elicit their WTP for increased entry fees and we identify visitor characteristics that explain variations in WTP for increased entry fees. We then estimate the mean and median WTP amounts and the use value that could be generated by knowledge of WHS designation using the contingent valuation method because of its design simplicity and suitability to evaluate policy-relevant questions (Hanemann, 1994). Finally, we propose a revenue-maximizing entry fee and discuss policy implications for the sustainable management of World Heritage Natural Sites in general. Specifically, the goals of this study are to survey international tourists to Mount Everest National Park to assess: (1) knowledge about the park's World Heritage Status; (2) added value that visitors place on World Heritage status; (3) WTP more for entry/user fees overall, and because of World Heritage status; and (4) any demographic trends (age, income, gender, etc.) that relate to WTP.

## The study area

Sagarmatha (Mount Everest) National Park (E 86° 30'53" to E 86° 99'08" and N 27° 46'19" to N 27° 6'45") was officially established in 1976 to protect unique Himalayan ecosystems within an area of 1148 km<sup>2</sup> (Figure 1), particularly from the negative impacts of tourism that flourished after the first ascent of Mount Everest in 1953. The park is enclosed by high mountain ranges and elevations vary from 2845 to 8848 m atop Mount Everest, the world's highest peak, which is flanked by 25 or more peaks over 6000 m. An additional area of 275 km<sup>2</sup> was designated as a buffer zone in 2002. The park's rugged terrain and the unique culture of the Sherpa people attract visitors from all over the world. Important wildlife species include Himalayan tahr (*Hemitragus jemlahicus*), serow (*Capricornis thar*), musk deer (*Moschus leucogaster*), goral (*Naemorhedus goral*), red panda (*Ailurus fulgens*) and Asiatic black bear (*Ursus thibetanus*); snow leopards (*Uncia uncia*) recolonized the region in the early 2000s from neighboring reserves after a 40-year absence (Ale, Yonzon, & Thapa, 2007).

The park is part of Nepal, India and China's Sacred Himalaya Landscape, a trans-boundary conservation area (World Wildlife Fund, 2013), and it is bordered by Makalu National Park to the east, Gauri Shanker Conservation Area to the west, and Qomolangma Nature Reserve in the Tibetan Autonomous Region of the People's Republic of China to the north, the largest single protected area in Asia. The park is a popular tourist destination and attracted more than 35,000 international visitors in 2013 (Figure 2), although there was volatility in visitor numbers in some years in the early 2000's due to political unrest caused by the Maoist insurgency that ended in late 2006 (Baral & Heinen, 2006). The primary sources of livelihoods include potato cultivation, livestock herding, trade and tourism. Of them, tourism is a major driver of the local economy. The provision of guides, porters, lodges, and other trekking and mountaineering services are major sources of employment for local people. About 3500 Sherpas reside in five main settlements and other small hamlets. The park's alpine/subalpine grasslands and scrublands (28%) and forests (3%) provide much needed grazing land for livestock, firewood and leaf-litter, and timber. No strict grazing rules were imposed but the

firewood collection, timber harvesting, and use and collection of non-timber products, as in any national park, have been strictly banned or regulated.

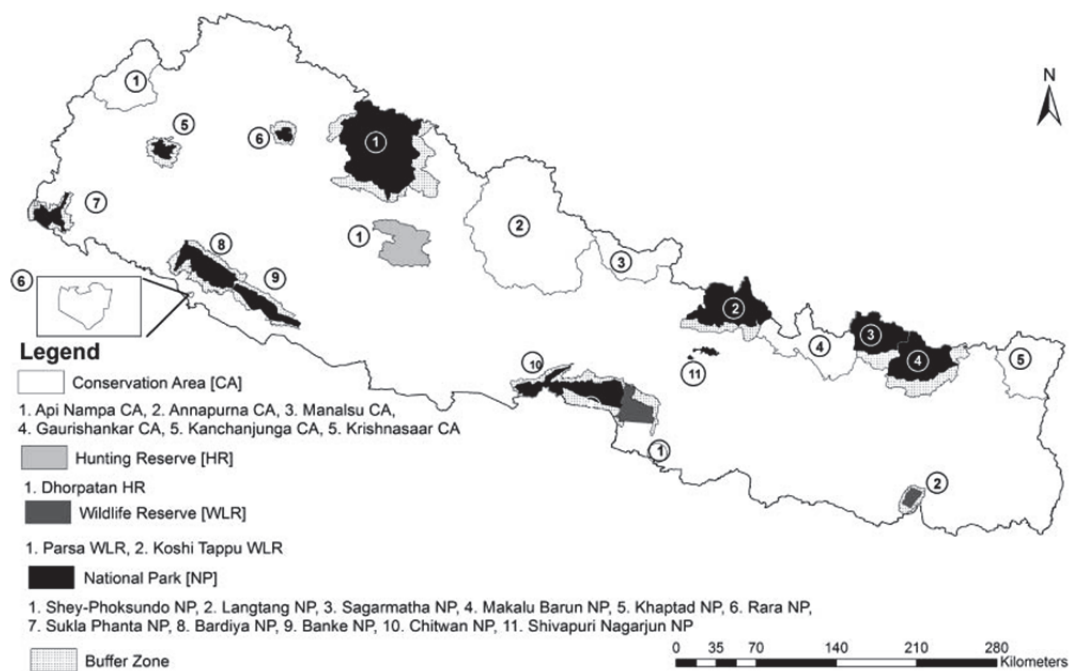


Figure 1. Sagarmatha National Park and its buffer zone (in black represented by 3) along with networks of protected areas in Nepal.

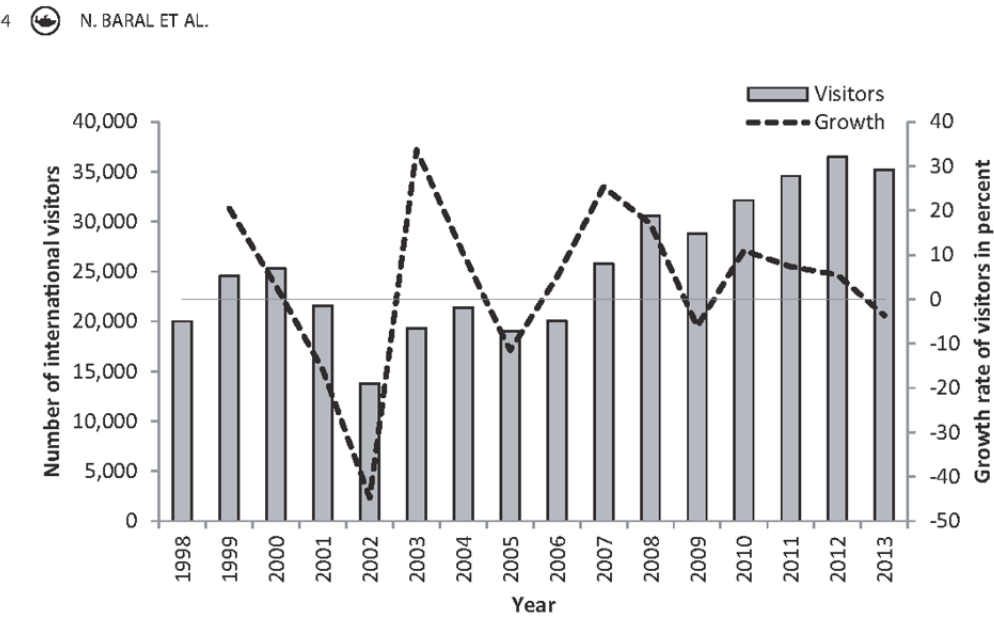


Figure 2. Number of international visitors and their growth rate in Sagarmatha National Park (SNP), Nepal since 1998. The sharp decline in visitor numbers in 2002 can be attributed to the events such as the Royal Palace massacre in Nepal and the 9/11 terrorist attack in the United States. Data source: SNP Tourist Information Center, January 2014.

## Methods

### *Sampling and data collection*

Based on our prior experience and literature review, a questionnaire was drafted that was reviewed by 12 experts in the social science field for content, clarity, and organization. The review panel had expertise in sustainable tourism, protected areas management, non-market valuation and questionnaire design. After incorporating the experts' comments and suggestions, the revised instrument was tested with a convenience sample of 30 tourists in Kathmandu. In light of respondents' feedback, some minor changes were made to the instrument for clarity. The final four-page questionnaire contained 42 questions and was divided into five sections starting with trip characteristics, perceptions of the park, contingent valuation of entry fees, and background information. Both closed-ended and open-ended questions were posed. The questionnaire was written in English and variables were measured on dichotomous, ordinal and continuous scales. The questionnaire is available upon request and the contingent valuation portion is provided in Supplemental Data as Table S1 in the web-based version of this paper.

The questionnaire was self-administered and took about 30 minutes to complete. We collected primary data through visitor surveys in November 2011. It was not feasible to get an accurate sampling frame of international visitors a priori, which precluded the use of easier probability sampling techniques such as simple random sampling. We surveyed visitors to the park in two phases, implementing cluster sampling and systematic random sampling strategies in sequence. Our sampling frame consisted of 99 hotels in total within the major trekking routes in the park. We performed cluster sampling of visitors by randomly selecting 3–5 hotels each day through lottery (in total 20 hotels were surveyed at least once). Because visitors are often distributed indiscriminately among the hotels, each hotel cluster can be seen as heterogeneous. A research assistant was trained to carry out field surveys, and collect accurate and complete data following standard survey procedures. He approached all visitors staying in the sampled hotels, briefed them about the research purpose and requested their participation. After soliciting verbal consent, the research assistant handed questionnaires to visitors to fill out on their own and remained in the hotel to answer questions and provide clarification while questionnaires were being completed.

After completing 174 observations, this sampling strategy became increasingly difficult to implement and inefficient. We thus instructed the research assistant to implement a systematic random sampling of visitors at tourist checkpoints within the park, resulting in 348 additional observations. No statistically significant differences were found in important variables between the samples collected through cluster sampling and systematic random sampling.

The self-administration strategy for questionnaire survey not only reduced any potential biases associated with the interviewer but also provided greater anonymity for information people may consider sensitive. Of the 614 visitors who were requested to fill out the questionnaire, 522 actually returned the questionnaires and 51 declined to participate. Declining visitors reported that they were tired, not interested in taking the questionnaire, or lacked the experience as they had just began the trek. The overall response rate was 85%. Eighty-nine questionnaires had missing data on one or another key variable, but there was no systematic pattern in missing data points. We used only complete questionnaires, so the effective sample size for our analyses was 433. Data imputation techniques were not used to replace missing values as they do not add information and this sample size was considered adequate for our purposes.

### *Theoretical and statistical models*

The contingent valuation method was used to estimate the WTP of park visitors for increased entry fees. This method has been successfully implemented to assess entry fees for gaining access to protected areas worldwide (e.g. Baral & Dhungana, 2014; Baral, Stern, & Bhattarai, 2008; Bhat, 2003; Mmopelwa, Kgathi, & Molefhe, 2007; Wang & Jia, 2012; Xuewang, Jie, Ruizhi, Shi'en, & Min, 2011). WTP is defined as the amount that an individual will pay for environmental quality improvement by remaining on the same indifference curve, that is

$$V(y - WTP, q^1, p, X; \alpha, \varepsilon) = V(y, q^0, p, X; \alpha, \varepsilon), \quad (1)$$

where  $V$  is the indirect utility function,  $y$  is the individual income,  $q$  corresponds to environmental quality that increases from  $q^0$  to  $q^1$ ,  $p$  denotes the vector of prices,  $X$  is a matrix containing respondent characteristics,  $\alpha$  denotes preference parameters, and  $\varepsilon$  is the error component.

The WTP question in our questionnaire asked visitors if they were willing (or not) to pay stated bid amounts as new entry fees to provide more funds to cater to visitors' needs, conserve biodiversity and address management problems. As such, the contingent valuation question was framed using the single-bounded closed ended format (Supplemental Data Table S1).

A visitor's response to a closed-ended contingent valuation question is such that

$$R = \begin{cases} \text{"Yes"} & \text{if } WTP > Bid \\ \text{"No"} & \text{if } WTP \leq Bid \end{cases} \quad (2)$$

where  $R$  denotes the response and  $Bid$  is the stated entry fee posed in the WTP question. We randomly allocated 10 bid amounts (\$20, \$30, \$40, \$50, \$60, \$70, \$80, \$90, \$100, and \$120) in equal proportion to surveyed visitors. Because the entry fee at the time of the survey was \$13 and we targeted visitors who were already inside the park, we chose the above bid amounts (or potential future entry fees) higher than the entry fee based on the pilot survey, prior experience of conducting similar studies (Baral & Dhungana, 2014; Baral et al., 2008) and literature review. In the final samples, the frequency distribution of the 10 bid amounts ranged between 6.6% and 12.4%.

The probability of "yes" and "no" responses to the contingent valuation question can be modeled as

$$Pr(R = \text{"Yes"}) = 1 - F(\alpha + \gamma Bid + X'\beta), \quad (3)$$

$$Pr(R = \text{"No"}) = 1 - Pr(R = \text{"Yes"}) = F(\alpha + \gamma Bid + X'\beta), \quad (4)$$

where  $F(\cdot)$  is the cumulative density function,  $\gamma$  is the coefficient for the  $Bid$  variable, and  $b$  is the vector of coefficients for other independent variables. In our analysis, the variables in matrix  $X$  belonged to the following broader categories: visitor characteristics, park utilization, perceptions regarding the park. Visitor characteristics included the variables such as age; gender, educational attainment, and employment status of the visitors (see Supplemental Data Table S2). Park utilization included variables such as whether visitors hired a guide while in the park, the number of days spent in the park and the visitors' overall satisfaction with the trip. Variables such as visitors' knowledge about the park's WHS designation and substitution for the park – and their perceptions regarding the authenticity, unimpaired condition and outstanding universal value of the park – constituted the category "perceptions regarding the park". We also included a variable asking whether the visitors were members of any environmental organizations as a proxy for their attitudes towards the environment. All the above mentioned variables were included in the model because previous studies have shown statistically significant relationships of the WTP to such variables (Baral & Dhungana, 2014; Baral et al., 2008; Chen & Jim, 2012; Lee & Han, 2002; Moran, 1994; Richardson, Rosen, Gunther, & Schwartz, 2014; Shultz, Pinazzo, & Cifuentes, 1998; White, Bennett, & Hayes, 2001). We assume that  $V$  is linear in income, therefore " $y$ " drops out of Equation (1) (Hanemann, Loomis, & Kanninen, 1991).

Since the response variable was measured on a dichotomous scale, a logistic regression was used to model the data and estimate the mean/median WTP. We used the logistic cumulative density

function:  $F(\cdot) = 1/[1 + e^{\alpha + \gamma Bid + X'\beta}]$  in Equations (3) and (4). With that, the log likelihood function for utility maximization for the two sets of responses (yes and no) is

$$\ln L(Bid, X, \alpha, \gamma, \beta) = \sum_i R_y \times \ln \pi y + R_n \times \ln(1 - \pi y), \quad (5)$$

where  $R_y$  is “1” if individual “i” says “yes” to the stated Bid amount, otherwise “0.” Similarly,  $R_n$  takes the value “1” if the individual does not agree to pay the bid and “0” otherwise.  $py$  is the  $\Pr(R=\text{“Yes”})$  from Equation (3). Equation (5) is solved using a maximum likelihood estimator and the mean/median WTP is  $(\alpha + \bar{x}'\beta)/\gamma$ , where  $x$  is the vector containing the means of independent variables.

All analyses were conducted in Stata 13.0 (StataCorp LP, College Station, TX). The confidence intervals for mean/median WTP were estimated using bootstrap simulations. The “wtpcikr” command in Stata was used to estimate confidence intervals using Krinsky and Robb’s method (Lyssenko & Martinez-Espineira, 2012). This method uses parametric bootstrapping to estimate the empirical distribution of a measure, which is non-linear in parameters. At first, the coefficients of the WTP model and their variance-covariance matrix are estimated. Then a new vector of coefficients is estimated by randomly drawing from the standard normal distribution given the estimated coefficients and variance-covariance matrix. Finally, the new vector of coefficients is used to re-estimate the mean/median WTP. Using these procedures, we ran 5000 simulations to obtain the distribution of mean/median WTP that was used to compute 95% confidence intervals of the corresponding WTP summary measure.

## Results

### *Visitors’ characteristics*

A majority of international visitors (81.9%) stated that the primary purpose of their trip to Nepal was to visit Mount Everest National Park. On this trip, 7.7% of visitors were traveling by themselves, 12.5% with family, 31.1% with friends, 7.5% with family and friends, 39.2% with a tour group, and 2.1% responded “others”. On average, the travel group size was 6.73  $\pm$  5.33. International visitors spent 13.02  $\pm$  5.32 days, on average, inside the park. Their reported average expenditure was US \$57.01  $\pm$  160.44 per day, but the median expenditure was \$30 per day, which was more reasonable than the mean. About 15% of visitors had completed high school, 17.9% had associate’s degrees, 30.9% had undergraduate degrees, 30.7% had master’s degrees, and 4.7% had doctoral degrees (see Discussion).

About two thirds of the visitors (65.8%) were employed full time, 6.0% were employed part time, 10.4% were temporarily unemployed, 8.1% were retired, 3.9% were students, and 3.2% were homemakers. Few visitors (2.5%) chose the “other” category to report their employment status. If the respondents were currently in the labor force (i.e. employed full or part time) then their economic status was considered active. Respondents were from 34 countries throughout the world. The top five countries in terms of visitor numbers were the United Kingdom (23.2%), Australia (13.4%), the United States (9.4%), France and Germany (6.7%), and Canada (6.5%), which also match the distribution of actual visitors to the park. See Supplemental Data Table S2 for more information.

### *Knowledge of and experience with WHS*

Many international visitors (47.3%) reported that they learned about Mount Everest National Park from family and friends and 44.3% mentioned the web/internet, 31.5% guidebooks, 16.4% travel agencies, 13.9% magazines, and 2.1% other sources. More than three fourths of visitors (76.2%) were aware of the World Heritage designation but fewer (57.3%) knew that Mount Everest National Park was a WHS prior to their trip. Furthermore, 65.1% stated that the WHS designation did not influence their decision to visit, 22.9% stated that it influenced their decision to a limited or moderate extent, and only 12.0% stated the WHS designation influenced their decision to a large or very large extent. A large majority (81.4%) reported that they did not see the WHS logo inside the park.

Almost all visitors (95.8%) mentioned that they would recommend their family and friends to visit Mount Everest National Park. In general, visitors agreed that the park had outstanding universal value, they reported the park experience to be authentic and they considered the park to be whole and intact (Supplemental Data Table S2).

### *Predictors of willingness to pay*

The logistic regression model appears to be valid and reliable because the statistically significant value of hat ( $z = 7.28$ ,  $p < 0.01$ ) and the insignificant value of hat squared ( $z = 1.1$ ,  $p = 0.266$ ) indicate

that the major statistical assumptions were met and the model was correctly specified ( $\chi^2 = 122.15$ ,  $df = 14$ ,  $p < 0.001$ ). In an auxiliary regression, taking predicted values as an explanatory variable and the actual outcome as a response variable,  $\hat{\beta}$  is a coefficient of the predicted values and  $\hat{\beta}^2$  is a coefficient of the quadratic term. Furthermore, the model correctly specified 76.7% of all cases. Of the 14 explanatory variables included in the logistic regression model, seven significantly predicted the people who were more likely to agree to pay higher entry fees (Table 1). Both visitor characteristic variables (gender and education) were statistically significant at the 10% significance level. Males were less likely to agree to pay higher entry fees than were females and the chance of saying “yes” to the WTP question decreases by 38.4% if the respondent was male. Similar gender-specific results have been found in other WTP studies (e.g. Kline et al., 2012).

Table 1. Logistic regression of willingness to pay on trip characteristics and socio-demographic variables. Bold typeface indicates statistical significance.

Willingness to pay	Coefficient	Std. Error	z	p	Effect size
Bid amount	<b>-0.034</b>	0.005	<b>-7.41</b>	0.001	<b>-3.4%</b>
Gender	<b>-0.485</b>	0.255	<b>-1.90</b>	0.057	<b>-38.4%</b>
Education	0.198	0.112	1.77	0.077	21.2%
Age	<b>-0.001</b>	0.011	<b>-0.05</b>	0.957	<b>-0.1%</b>
Economic status	0.036	0.289	0.13	0.900	3.7%
Environmental membership	<b>-0.473</b>	0.321	<b>-1.47</b>	0.141	<b>-37.7%</b>
Use of a guide	1.182	0.304	3.88	0.001	226.1%
Visitor days	0.060	0.026	2.33	0.020	6.2%
Park substitute	<b>-0.580</b>	0.296	<b>-1.96</b>	0.050	<b>-44.0%</b>
Knowledge of SNP's WHS designation	0.559	0.254	2.20	0.028	74.9%
Satisfaction with the trip	0.104	0.108	0.96	0.336	11.0%
Unimpaired condition of the park	0.083	0.072	1.16	0.248	8.6%
Outstanding universal value of the park	0.011	0.051	0.22	0.827	1.1%
Authenticity of the park	<b>-0.004</b>	0.133	<b>-0.03</b>	0.976	<b>-0.4%</b>
Constant	<b>-0.504</b>	<b>0.38</b>	<b>0.704</b>		
Model fit statistics	4, $p < 0.001$ , $n = 417$ , Log likelihood = <b>-203.03</b> , pseudo $R^2 = 0.23$ , correctly classified = 76.7%				

Higher levels of formal education positively influenced WTP. Moving from one lower level to the next higher level of education, the likelihood of a ‘yes’ response to the WTP question increased by 21.2%. Visitors who hired a guide on their trip to the park were about three times more likely to agree to pay higher entry fees compared to those who did not hire a guide. Those visitors who stayed longer in the park were also more likely to agree to pay higher entry fees than those who stayed for shorter duration. If the visitors thought that a close substitute existed for the park for a similar experience, the odds of their WTP higher entry fees decreases by 44.0%. Prior knowledge of the designation of the park as a WHS also had a positive influence on WTP. For visitors who had heard of Mount Everest's WHS designation, the chance of saying yes to the WTP question increased by 74.9% compared to those who had not. All other variables in our model were insignificant in explaining variation in WTP responses.

As expected, the variable “Bid amount” had a significantly negative effect on the WTP responses. For each one dollar increase in entry fees, the odds of saying yes to the WTP question decreased by 3.4%. On plotting the observed probability of “yes” responses against the bid amounts, there was a downward sloping demand curve (Figure 3). This finding, along with the narrow gap between the observed and predicted probabilities, provided some evidence for the theoretical validity of the model.

In response to a follow-up question about why visitors were willing (or not) to pay higher entry fees, 81.9% of respondents provided written responses (Table 2). The three most important reasons for WTP higher entry fees were that they would like to pay for the protection of the park, the pro-

posed entry fee was affordable and they thought the park to be so unique (in terms of scenery, mountains and trekking opportunities, etc.) as to justify higher entry fees. A few visitors were willing to pay higher entry fees on the condition that the money be used properly. The top three reasons for visitors' unwillingness to pay higher entry fees were that they could not afford the proposed entry fee, they were willing to pay lower amounts than the proposed entry fee and they distrust government officials for the proper use of money.

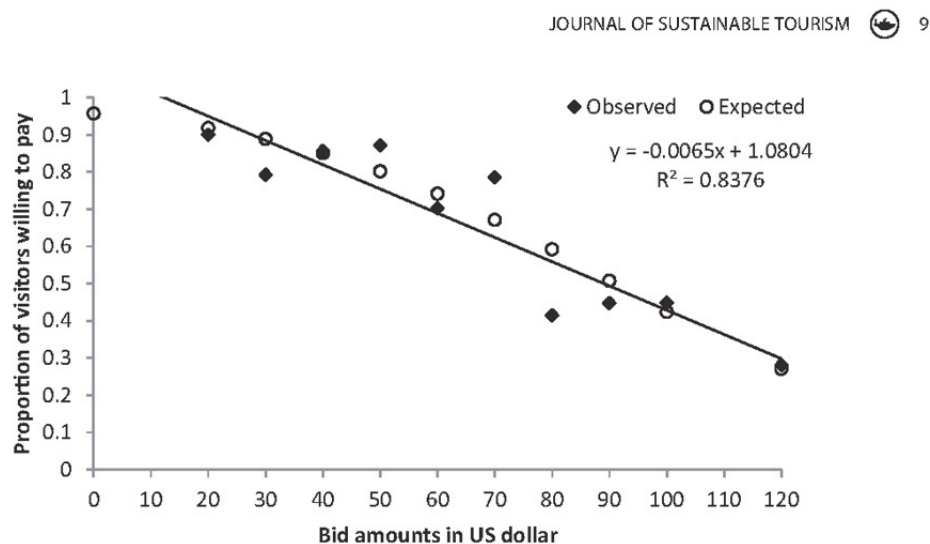


Figure 3. A demand function derived from the observed frequency of “yes” responses (y) to various bid amounts (x) presented as potential future entry fees.

#### *Value of WHS designation*

At the time of the survey, 63.8% of visitors were willing to pay higher entry fees than the (then) park entry fee of US \$13 per visit. The mean and median WTP was \$91.45, and the 95% confidence intervals for the mean ranged from \$83.56 to \$102.82. More than two thirds of respondents (68.4%) thought that the new entry fee would be acceptable to visitors. To examine the association between visitors' income levels and their WTP decisions, we also specified another WTP model by including the income variable. As expected, income had a positive and significant impact on WTP (Figure 4). The fitted regression line between median WTP and different income categories showed that the median WTP amount would increase by about \$6 while moving from any one lower level of income bracket to the next higher level.

Table 2. Summary of visitors' stated important reasons for their WTP decisions regarding increased park entry fees.

Emerging categories of the stated reasons	Frequency
Individuals who responded “Yes” to the WTP question, $n = 281$	
Pay for preserving, protecting or conserving the park	23.5%
Proposed entry fee is affordable	13.9%
Pay for the uniqueness of the park	10.7%
Pay only if the money is used properly	3.6%
Help the region financially or otherwise	1.1%
Individuals who responded “No” to the WTP question, $n = 145$	
Proposed entry fee is not affordable	44.1%
Willing to pay a lower amount than the proposed entry fee	8.3%
Distrust of government officials for the proper use of money	5.5%
Entry fee hike reduces tourism because only wealthy people can visit the park	3.4%

We also evaluated the impact of the WHS designation on WTP. There was a statistically significant difference between visitors who were aware of the WHS designation prior to arriving in the park and those who were not regarding the WTP. Thus, one way to assign the value for the WHS designation was to predict the median WTP amounts separately for each type of visitor. The difference between the two median WTP amounts could be assigned as the value of WHS designation. The median WTP amount for visitors who were aware of the park's WHS designation was \$97.73 compared to \$81.34 who were unaware. Thus, the median difference due to the WHS designation was \$16.39. Given 34,571 international visitors in 2011, the total economic value that could be generated by the WHS designation was US \$566,619. Hence, the WHS designation alone accounted for 21.3% of the median WTP amount in this case.

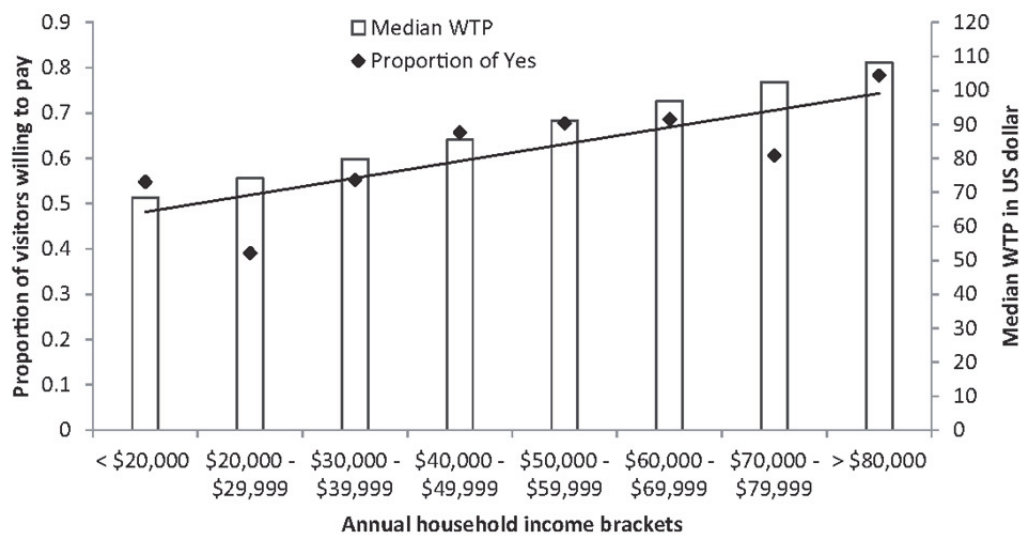
10  N. BARAL ET AL.

Figure 4. Relationship between visitors' income levels, their WTP decisions and median WTP amounts.

Finally, based on our WTP results, we found that there is an opportunity to raise park entry fees. We conducted simulations with four potential future entry fees between \$40 and \$91 to project revenues and identify the revenue-maximizing fee. We projected the expected number of visitors and expected revenue with these entry fees and computed the revenue surplus in comparison to the status quo scenario (that is, the entry fee at the time of the survey) for seven years into the future (Table 3). If the park entry fees were increased to \$40, on average, total revenue would increase by 12.5% compared to the status quo over the next seven years. Similarly, if entry fees were increased to \$60, \$80 and \$91, the average increase in the revenue would be 39.4%, 45.7% and 43.2%, respectively, compared to the status quo over seven years (Figure 5). The estimated revenue maximizing entry fee was \$80.



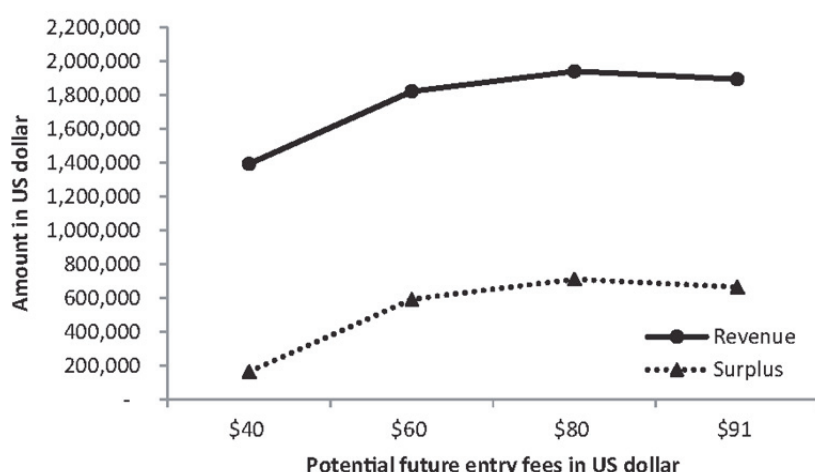


Figure 5. Average amount of revenue generated per year over the next seven years (2014 to 2020) and surplus revenue compared to the current entry fee under the scenarios of four potential future entry fees.

Table 3. The expected number of visitors, the amount of revenue generated in the status quo scenario of present entry fee, and the expected revenues and surpluses compared to the status quo scenario under the four potential future entry fees calculated based on the parameters estimated by the WTP model.

Year	Predicted visitors	Status quo revenue	Fee increased to US \$40			Fee increased to US \$60			Fee increased to US \$80			Fee increased to US \$91		
			Visitors	Revenue	Surplus	Visitors	Revenue	Surplus	Visitors	Revenue	Surplus	Visitors	Revenue	Surplus
2014	36,539	1,096,159	31,065	1,242,606	146,447	27,082	1,624,946	528,787	21,635	1,730,762	634,603	18,558	1,688,776	592,617
2015	37,927	1,137,813	32,246	1,289,825	152,012	28,112	1,686,694	548,881	22,457	1,796,531	658,718	19,263	1,752,949	615,136
2016	39,368	1,181,050	33,471	1,338,838	157,788	29,180	1,750,789	569,739	23,310	1,864,799	683,749	19,995	1,819,561	638,511
2017	40,864	1,225,930	34,743	1,389,714	163,784	30,289	1,817,319	591,389	24,196	1,935,662	709,732	20,755	1,888,705	662,775
2018	42,417	1,272,515	36,063	1,442,523	170,008	31,440	1,886,377	613,861	25,115	2,009,217	736,702	21,544	1,960,475	687,960
2019	44,029	1,320,871	37,433	1,497,339	176,468	32,634	1,958,059	637,188	26,070	2,085,567	764,696	22,362	2,034,973	714,102
2020	45,702	1,371,064	38,856	1,554,238	183,174	33,874	2,032,465	661,401	27,060	2,164,819	793,755	23,212	2,112,302	741,238

Predicted visitors: The average growth rate of visitors from 1998 to 2013 was 3.8% per year. Based on the assumption that there would be average growth in the future, the estimates of visitors were made for the next seven years.

Status quo revenue: The current revised entry fee is about US \$30 (it varies slightly due to exchange rate fluctuations). The multiplication of predicted number of visitors and the current entry fee yielded the status quo revenue.

Visitors: If the entry fee is increased, the econometric model predicts the decrease in the number of visitors. The predicted number of visitors in the status quo scenario is adjusted by the appropriate decline rate for each proposed entry fees.

Revenue: This is the sum of visitors (the expected number of visitors to park in a particular scenario) times the proposed entry fee. Surplus: This is the additional revenue expected if the entry fee is increased by this particular amount.

## Discussion

Our results indicate that, on average, international visitors to Mount Everest National Park were willing to pay much more (over \$90) in entry fees to cater to visitors' needs, conserve biodiversity and address management problems, a general result in concordance with other such studies (e.g.

Casey et al., 2010; Lee et al., 2010). In 2012, the Government of Nepal increased the park entry fee to approximately US \$30 for international visitors. Our results indicate that international visitors were willing to pay about three times higher, on average, than the revised entry fee. Variation in WTP was explained by socio-demographic and trip characteristics such as gender, educational attainment, use of a guide, length of stay within the park, perception of substitution for the park, and knowledge about the park's WHS designation, general results that agree with other related studies (e.g. Buckley, 2003; Kline et al., 2012). In our study, visitors who knew about park's WHS designation prior to their visit were willing to pay about \$16 more on average than those who did not. WHSs thus can be seen as unique cases, which in turn can lead to ascribing greater values for designated parks.

As such, visitors who attach a higher value to a specific site are likely to agree to pay higher entry fees. A potential future entry fee of US \$80, slightly lower than the median WTP (\$91) found here, is the revenue maximizing entry fee based on our model. The results of this study support previous findings that many attractive protected areas have not fully captured the economic values that visitors place on them via entry fees (Baral & Dhungana, 2014; Baral et al., 2008; Casey et al., 2010; Hadker, Sharma, David, & Muraleedharan, 1997; Lee & Han, 2002; Reid-Grant & Bhat, 2009; White & Lovett, 1999). Highlighting the economic value of WH Sites can motivate policy makers and park management to revise entry fees and generate more revenue. This argument is also supported by the finding that the WHS designation positively influences visitors' willingness to visit sites elsewhere (Poria, Reichel, & Cohen, 2011). However, increasing entry fees to public parks can lead to social inequity by preventing access to people who could not afford them. Such inequity is not an issue in this case because there is no entry fee for Nepalese citizens and people from neighboring South Asian countries pay much lower fees (about \$3.00 at the time of our study). Compared to the total travel cost to Nepal, even the increased park entry fee is small for visitors from developed countries. Also other studies have indicated a higher WTP for general park admissions by tourists to Nepal (e.g. Baral & Dhungana, 2014; Heinen, 1990; Heinen & Thapa, 1988).

In our study, visitors were willing to pay more toward the entry fees for several reasons. Most visitors reported that they would pay a higher amount in order to preserve, protect and conserve the park, and for the uniqueness of the park. This is consistent as quality improvement is one of the prime motives for WTP. Moreover, many visitors reported that the proposed entry fee was affordable. However, some visitors suggested that they would pay only if the money was used properly implying that the park authorities need to demonstrate greater transparency and accountability in determining an entry fees and spending the revenue. Furthermore, a few visitors who were not willing to pay higher fee reported distrust with the government officials in using the collected money properly. This finding again reinforces the idea of demonstrating greater accountability in revenue and cost management by the park authorities.

Based on the regression results, the management authority can evaluate four variables to gain support of visitors if they decide to increase entry fees. First, the median WTP is the amount that at least 50% of visitors are willing to pay, so we can assume that increasing the fee at a rate lower than the median WTP would receive support from a majority (more than 50%) of visitors. Second, the management authority can encourage visitors to hire a guide and introduce programs to increase the visitors' length of stay within the park. Over 70% of visitors did not hire a guide and more return on investment could be gained by increasing the length of visit. Third, the management authority could focus on marketing the World Heritage designation to international visitors because more than 40% of visitors to Mount. Everest did not know that the park was a WHS before the survey was conducted. It is likely that many visitors might not know about the WHS designation even after their arrival because only 18% of visitors in our sample reported seeing the WHS logo inside the park. Thus, promoting and marketing the park's WHS designation could help to gain visitors' support for increased entry fees. Knowledge of a substitute site is shown to affect park valuation negatively (Willis, 2009). This is potentially because substitute sites can be seen as options for switching in case of rising costs of the primary site. Several high Himalayan sites in Nepal, such as Annapurna Conservation Area and Langtang National Park, are already well-visited and well-known, while others (e.g. Manaslu, Gaurishankar, Api Nampa and Kanchanjunga Conservation Areas) are not (Lama & Job, 2014).

However, these are also harder to reach, more challenging logistically and lacking in visitor facilities compared to better-known sites.

Logar (2010) reviewed a number of policy incentives that have been proposed in the literature, which should be evaluated for their effectiveness in managing tourism in case of Mount Everest National Park. An eco-tax levied on tourists is specifically earmarked for improving environment quality and may be beneficial for a low-resource country such as Nepal. Park quotas on the other hand limit the number of visitors that can be admitted to a site during a time period. Quotas may help manage tourism by reducing overcrowding and burden on park management staff, and also provide exclusivity to tourists thereby enriching their experiences. Yet, quotas work on the principle of excluding some visitors and that may be seen as unfair and restraining tourists' rights and equality. These alternative mechanisms need to be evaluated in the light of their feasibility in implementation, the elasticity of demand of park visitors, and how these mechanisms could result in reduced numbers of visitors as well as future revenues.

Although the WTP method is widely used, there are some limitations in this and related studies that should be taken into consideration when interpreting results (e.g. Carson & Mitchell, 1993; Hausman, 2012). First, the contingent valuation method has some potential biases and other sources of error. For example, people are asked if they are willing to pay more knowing that they will not be asked to pay more on this trip if they say yes, which could artificially inflate estimated WTP values. Also, much of the world was still suffering from the Great Recession in 2011, when this study was conducted, and unemployment was high in a number of Western countries, especially for young adults. This may have reduced the numbers of lower earning (and younger) trekkers to Nepal, which may have inflated our estimate. Notice, for example, that about 35% of the respondents in our sample reportedly had advanced graduate degrees (master's or doctorate), which is a much higher average educational attainment than has been reported in other foreign tourism studies in Nepal (e.g. Baral & Dhungana, 2014; Heinen & Thapa, 1988). People at the high end of educational attainment are also at the high end of income distribution in developed economies, which may have further inflated our estimated WTP.

Although we did our best to minimize some biases through a rigorous research design and extensive sampling, the nature of the study itself, and when it was completed, raises these questions. It is typical in contingent valuation literature to evaluate marginal effects of knowledge, attitude, awareness, and socio-demographic variables on WTP estimates (e.g. Buckley, 2003). We used visitors' prior knowledge of the WHS status of the park to evaluate the average marginal impact on WTP, and the economic value of the WHS designation was estimated here through statistical control that is not as powerful as conducting actual experiments. Future studies could use quasi-experimental approaches by administering at least two sets of questionnaires: one in which the World Heritage designation is not highlighted and another in which it is highlighted, to establish the economic value of the WHS designation more directly. Nonetheless, the findings provide insights into potential values of the WHS designation and we would assert that, even with the issues raised above, the park entry fee was well below the amount that could be charged to improve management, a common finding from related studies elsewhere (Asafu-Adjaye & Tapsuwan, 2008; Casey et al., 2010; Shultz et al., 1998). Given that high entry fees only to apply to international tourists who must spend much more than Nepalese or citizens of other South Asia nations in travel to Nepal, the higher suggested rate should not deter tourism or reduce equity in any substantial way.

## Conclusions

The findings of this study are important for several reasons. Evaluating WTP associated with the WHS designation is beneficial for examining the overall value of the park to visitors to assess whether entry fees could be raised from existing levels. The attraction that leads to excess tourism can be turned into financial resources to implement more effective management policies to protect the park from potentially negative impacts of tourism.

The study shows that WHS designation has an economic value in and of itself. In order to market WHSs as a brand, it is important to clearly communicate the value of WHS designation to visitors. By

doing so, visitors can feel good about making a greater return on their investment to visit the site (Steckenreuter & Wolf, 2013), which in turn can increase the likelihood of agreeing to pay higher entry fees.

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## References

1. Alberts, H.C., & Hazen, H.D. (2010). Maintaining authenticity and integrity at cultural world heritage sites. *Geographical Review*, 100(1), 56–73.
2. Ale, S.B., Yonzon, P., & Thapa, K. (2007). Recovery of snow leopard *uncia uncia* in Sagarmatha (Mount Everest) National Park, Nepal. *Oryx*, 41, 89–92.
3. Asafu-Adjaye, J., & Tapsuwan, S. (2008). A contingency valuation of scuba diving benefits: Case study in Mu Ko Similan Marine National Park, Thailand. *Tourism Management*, 29(6), 1122–1130.
4. Baral, N., & Dhungana, A. (2014). Diversifying finance mechanisms for protected areas capitalizing on untapped revenues. *Forest Policy and Economics*, 41, 60–67.
5. Baral, N., & Heinen, J.T. (2006). The Maoist people's war and conservation in Nepal. *Politics and the Life Sciences*, 24(1–2), 1–11.
6. Baral, N., Stern, M.J., & Bhattarai, R. (2008). Contingent valuation of ecotourism in Annapurna conservation area, Nepal: Implications for sustainable park finance and local development. *Ecological Economics*, 66(2–3), 218–227.
7. Barbier, E.B. (2014). Account for depreciation of natural capital. *Nature*, 515, 32–33.
8. Batisse, M. (1992). The struggle to save our world heritage. *Environment*, 34(10), 12–32.
9. Bhat, M.G. (2003). Application of non-market valuation to the Florida keys marine reserve management. *Journal of Environmental Management*, 67(4), 315–325.
10. Borges, M.A., Carbone, G., Bushell, R., & Jaeger, T. (2011). Sustainable tourism and natural world heritage – Priorities for action. Gland: IUCN.
11. Buckley, R. (2003). Pay to play in parks: An Australian policy perspective on visitor fees in public protected areas. *Journal of Sustainable Tourism*, 11(1), 56–73.
12. Carson, R.T., & Mitchell, R.C. (1993). The issue of scope in contingent valuation studies. *American Journal of Agricultural Economics*, 75, 1263–1267.
13. Casey, J.F., Brown, C., & Schuhmann, P. (2010). Are tourists willing to pay additional fees to protect corals in Mexico? *Journal of Sustainable Tourism*, 18(4), 557–573.
14. Chen, W.Y., & Jim, C.Y. (2012). Contingent valuation of ecotourism development in country parks in the urban shadow. *International Journal of Sustainable Development & World Ecology*, 19(1), 44–53.
15. Dongol, Y., & Heinen, J.T. (2012). Pitfalls of CITES implementation in Nepal: A policy gap analysis. *Environmental Management*, 50(2), 181–192.
16. Eagles, P.F.J. (2014). Research priorities in park tourism. *Journal of Sustainable Tourism*, 22(4), 528–549.
17. Frey, B.S., & Steiner, L. (2011). World heritage list: Does it make sense? *International Journal of Cultural Policy*, 17(5), 555–573.
18. Gu, Y., Du, J., Tang, Y., Qiao, X., Bossard, C., & Deng, G. (2013). Challenges for sustainable tourism at the Jiuzhaigou world natural heritage site in western China. *Natural Resources Forum*, 37(2), S103–S112.
19. Hadker, N., Sharma, S., David, A., & Muraleedharan, T.R. (1997). Willingness to pay for Borivli National Park: Evidence from a contingent valuation. *Ecological Economics*, 21(2), 105–122.
20. Hanemann, W.M. (1994). Valuing the environment through contingent valuation. *Journal of Economic Perspectives*, 8(4), 19–43.
21. Hanemann, M., Loomis, J., & Kanninen, B. (1991). Statistical efficiency of double-bounded dichotomous choice contingent valuation. *American Journal of Agricultural Economics*, 73(4), 1255–1263.
22. Hausman, J. (2012). Contingent valuation: From dubious to hopeless. *Journal of Economic Perspectives*, 26(4), 43–56.
23. Heinen, J.T. (1990). The design and implementation of a training program for tour guides in Royal Chitwan National Park, Nepal. Bangkok: FAO. Tiger Paper, 17(2), 11–15.
24. Heinen, J.T. (1995a). International conservation agreements. In W.A., Nierenberg (Ed.), *Encyclopedia of environmental biology* (volume 1) (pp. 375–384). San Diego, CA: Academic Press.
25. Heinen, J.T. (1995b). Applications of human behavioral ecology to wildlife conservation and utilization programmes in developing countries. *Oryx*, 29(3), 178–186.
26. Heinen, J.T. (2010). The importance of a social science research agenda in protected areas management. *Botanical Review*, 76, 140–164.
27. Heinen, J.T. (2012). International trends in protected areas policy and management. Retrieved 16 March 2017 from <http://www.intechopen.com/books/protected-area-management/international-trends-in-protected-areas-policy-and-management>
28. Heinen, J.T., & Rayamajhi, S. (2001). On the use of goal-oriented project planning in Nepalese protected area management. *Environmental Practice*, 3(4), 227–236.
29. Heinen, J.T., & Thapa, B.B. (1988). A feasibility study of a proposed trekking trail in Chitwan National Park. Kathmandu: Tribhuvan University. *Journal of the Forestry Institute*, 10, 19–28.
30. Heinen, J.T., Yonzon, P.B., & Leisure, B. (1995). Fighting the illegal fur trade in Kathmandu, Nepal. *Conservation Biology*, 9(2), 245–247.
31. Jha, S. (2005). Can natural world heritage sites promote development and social harmony? *Biodiversity and Conservation*, 14(4), 981–991.
32. Kline, C., Cardenas, D., Duffy, L., & Swanson, J.R. (2012). Funding sustainable paddle trail development: Paddler perspectives, willingness to pay and management implications. *Journal of Sustainable Tourism*, 20(2), 235–256.
33. Lama, A.K., & Job, H. (2014). Protected areas and the road development: Sustainable development discourses in the Annapurna Conservation Area, Nepal. *Erdkunde*, 68(4), 229–250.
34. Landorf, C. (2009). Managing for sustainable tourism: a review of six cultural World Heritage Sites. *Journal of Sustainable Tourism*, 17(1), 53–70.

38. Lee, C.K., & Han, S.Y. (2002). Estimating the use and preservation values of national parks' tourism resources using a contingent valuation method. *Tourism Management*, 23(5), 531–540.
39. Lee, C.K., Lee, J.H., Kim, T.K., & Mjelde, J.W. (2010). Preferences and willingness to pay for bird watching tours and interpretive services using a choice experiment. *Journal of Sustainable Tourism*, 18(5), 695–708.
40. Logar, I. (2010). Sustainable tourism management in Crikvenica, Croatia: An assessment of policy instruments. *Tourism Management*, 31(1), 125–135.
41. Lyssenko, N., & Martinez-Espineira, R. (2012). Been there done that: Disentangling option value effects from user heterogeneity when valuing natural resources with a use component. *Environmental Management*, 50(5), 819–836.
42. Mmopelwa, G., Kgathi, D.L., & Molefhe, L. (2007). Tourists' perceptions and their willingness to pay for park fees: A case study of self-drive tourists and clients for mobile tour operators in Moremi Game Reserve, Botswana. *Tourism Management*, 28(4), 1044–1056.
43. Moran, D. (1994). Contingent valuation and biodiversity: Measuring the user surplus of Kenyan protected areas. *Biodiversity and Conservation*, 3, 663–684.
44. Nyaupane, G.P., Lew, A.A., & Tatsugawa, K. (2014). Perceptions of trekking tourism and social and environmental change in Nepal's Himalayas. *Tourism Geographies*, 16(3), 415–437.
45. Okech, R.N. (2010). Socio-cultural impacts of tourism on World Heritage sites: Communities' perspective of Lamu (Kenya) and Zanzibar Islands. *Asia Pacific Journal of Tourism Research*, 15(3), 339–351.
46. Poria, Y., Reichel, A., & Cohen, R. (2011). World Heritage Site – Is it an effective brand name? A case study of a religious heritage site. *Journal of Travel Research*, 50, 482–495.
47. Reid-Grant, K., & Bhat, M.G. (2009). Financing marine protected areas in Jamaica: An exploratory study. *Marine Policy*, 33(1), 128–136.
48. Richardson, L., Rosen, T., Gunther, K., & Schwartz, C. (2014). The economics of roadside bear viewing. *Journal of Environmental Management*, 140, 102–110.
49. Ryan, J., & Silvano, S. (2009). The World Heritage list: The making and management of a brand. *Place Branding and Public Diplomacy*, 5, 290–300.
50. Shackley, M. (Ed.). (1998). *Visitor management: Case studies from World Heritage Sites*. Oxford: Butterworth-Heinemann.
51. Shrestha-Acharya, R., & Heinen, J.T. (2006). Emerging policy issues on non-timber forest products in Nepal. *Himalaya*, 26(1–2), 51–54.
52. Shultz, S., Pinazzo, J., & Cifuentes, M. (1998). Opportunities and limitations of contingent valuation surveys to determine national park entrance fees: Evidence from Costa Rica. *Environment and Development Economics*, 3(1), 131–149.
53. Steckenreuter, A., & Wolf, I.D. (2013). How to use persuasive communication to encourage visitors to pay park user fees. *Tourism Management*, 37, 58–70.
54. Su, Y.W., & Lin, H.L. (2014). Analysis of international tourist arrivals worldwide: The role of world heritage sites. *Tourism Management*, 40, 46–58.
55. Timilsina, N., & Heinen, J.T. (2008). Forest structure under different management regimes in the western lowlands of Nepal: A comparative analysis. *Journal of Sustainable Forestry*, 26(2), 112–131.
56. UNESCO. (2014). Operational guidelines for the implementation of the World Heritage Convention. Paris: World Heritage Center. Retrieved 24 November 2014 from <http://whc.unesco.org/en/guidelines/>
57. Wang, P.W., & Jia, J.B. (2012). Tourists' willingness to pay for biodiversity conservation and environment protection, Dalai Lake protected area: Implications for entrance fee and sustainable management. *Ocean & Coastal Management*, 62, 24–33.
58. White, P.C., Bennett, A.C., & Hayes, E.J.V. (2001). The use of willingness-to-pay approaches in mammal conservation. *Mammal Review*, 31(2), 151–167.
59. White, P.C.L., & Lovett, J.C. (1999). Public preferences and willingness to pay for nature conservation in the North York Moors National Park, UK. *Journal of Environmental Management*, 55, 1–13.
60. Whitelaw, P.A., King, B.E.M., & Tolkach, D. (2014). Protected areas, conservation and tourism – Financing the sustainable dream. *Journal of Sustainable Tourism*, 22(4), 584–603.
61. Willis, K.G. (2009). Assessing visitor preferences in the management of archaeological and heritage attractions: A case study of Hadrian's Roman Wall. *International Journal of Tourism Research*, 11(5), 487–505.
62. World Wildlife Fund. (2013). The Sacred Himalaya Landscape. Retrieved 16 March 2017 from [http://assets.worldwildlife.org/publications/326/files/original/The\\_Sacred\\_Himalayan\\_Landscape.pdf?1345732409](http://assets.worldwildlife.org/publications/326/files/original/The_Sacred_Himalayan_Landscape.pdf?1345732409)
63. Xuewang, D., Jie, Z., Ruizhi, Z., Shi'en, Z., & Min, L. (2011). Measuring recreational value of world heritage sites based on contingent valuation method: A case study of Jiuzhaigou. *Chinese Geographical Science*, 21(1), 119–128.

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LETTER

## Some Thoughts on Improving the Quality of English Courses in Vocational High Schools

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**Abstract.** At present, the quality of English courses in vocational schools of China is still a considerable distance from our expectations. The process of improving the quality of English courses in vocational schools is tortuous and bright. In this tortuous process, it is not enough to rely solely on the efforts of English teachers in Vocational schools. In addition to vocational high school English teachers should be clear about their duties, the entire vocational school system, vocational high school students are indispensable elements, should all be actively involved. This article is aimed at improving the quality of English courses in Vocational schools.

**Keywords:** Vocational high school; vocational education; English teaching; teenagers.

The famous educator Mr. Zheng Xiaocang once wrote in the book: "the success of education, teachers or family elders by force is not a party; it is ultimately required from all walks of life together to create education together." The resultant force of education refers to the concern and commitment of the various circles of society to the educational cause. Admittedly, the current high school English curriculum quality distance is still a long way to our expectations, and change the status quo, the need to enhance the quality of the course of the journey, the most is precisely the lack of education. Our joint efforts in education focus mainly on the strength of the three parties, one is the participation of the whole vocational school system; two is the labor and cultivation of the English teachers; three, the efforts and struggles of the vocational school students themselves.

### 1. Vocational Colleges Should Change their Ideas

The influence of the school environment on students' English learning is undoubtedly far-reaching. At present, in the process of cohesion to help the students of Vocational Colleges learn English knowledge, it is the most urgent for the whole vocational college system to change its concept and participate actively. Vocational schools under the traditional concept are not very concerned about English courses. Taking English classes as a cultural class does not seem to matter, in contrast to many specialized courses that directly affect student employment and school employment.

Have to admit that it is because of such a negative, outdated point of view, in the entire vocational school system, the neglect of English classes quietly blowing. Of course, a school has its own professional characteristics, the focus of the curriculum is reasonable things, but too much neglect of English courses on the development of students, there is no harm. On the one hand, the English language has now become the world language, master the English knowledge base, whether to continue their studies in the aspect of students, or in promoting students' employment, have played an active role in promoting. On the other hand, students have already acquired a certain amount of English knowledge in junior high school. The students are based on English. As long as the school creates a good study atmosphere, it is not difficult for the students to learn English well. The key point

is that schools need to change their attitudes towards English language courses, and they need to set up the concept of paying attention to students' English learning. You know, the school's ideas and attitudes affect or even influence the students from the root. In the specific practice of the English curriculum change the concept of vocational colleges is also embodied to buy more English supplementary books, carry out a variety of English language courses in English teaching activities, and increase investment and so on. In a word, it is urgent for the vocational colleges to change their concepts and face up to the status of English courses.

## **2. Vocational High School English Teachers Should Be Clearly Responsible**

Wei Shusheng, a famous special teacher, once said, "in all the factors of education, the relationship between the teaching level of teachers and the quality of curriculum is the most closely related." Similarly, among the factors that may improve the quality of English courses in vocational schools, our English teachers are most duty bound. Clear your shoulders the responsibility is the first step, is also a crucial step in here, I want to emphasize is that high school English teachers need to clear the three aspects of responsibility, one is to help students to reinforce English basic responsibility; two is the real application to guide students to learn the knowledge of English ability is to improve the responsibility; three the literature quality of students' responsibility.

First of all, to help students consolidate their English foundation is the most basic responsibility. Most vocational school students may have a relatively weak foundation in English. Therefore, from the angle of teaching students in accordance with their aptitude, it is very important to pay attention to the teaching of basic knowledge. The students' basic knowledge is gradually strengthened so that we can better perform other duties. Secondly, it is to train students' ability to apply English knowledge. The purpose of learning is to apply, not to speak of a language like English. However, at present, many teachers just forget this point, and in the process of teaching, they still follow the old path of exam oriented education. They do not exert enough effort to train students' practical strength. In class, we should set up more links to help students apply the English knowledge they have just learned, and help them apply their knowledge to help them realize the application and transfer of knowledge. Once again, is to do everything possible to enhance students' literature literacy duties. English is a language as well as a culture. It is not confined to a particular country, but it embodies the culture of the whole western world. As far as culture is concerned, communication will spark new sparks. And we want to communicate, want to collide, we must understand it, English class is undoubtedly high vocational students contact and understands the best environment for Western culture. After the students' literature quality has been improved, they are not only more interested in learning English, but also more profound when they are looking at many problems. Specifically, in the process of teaching, teachers can introduce more cultural materials, help students understand western culture and customs; also, can arrange some guide students to understand the western culture homework, help students to enrich and improve the process of doing homework.

In a word, the quality of English teachers in vocational schools is the most direct influence on the quality of courses, and the promotion of each teacher's quality and the explicit sense of responsibility are inseparable. Clear responsibilities, we can better perform their duties, clear responsibilities, we can enhance the quality of English courses in vocational schools in the journey to play more positive role.

## **3. Vocational High School Students Should Build Self-Confidence**

At present, most of the researchers hope that the quality of English courses in vocational schools will be raised in vocational schools and English teachers in vocational schools are expected to be promoted. In fact, they ignore a very critical group, that is, vocational high school students. Some people say, "There are no bad students, only teachers who do not teach them." I don't fully agree, although the art of teaching effect of teachers' major, however, is not to say that a teachers' efforts, can really help all students to be all-round development of elite generation. In other words, the students' own efforts are also crucial. Therefore, when we seek to improve the quality of the effective path of

the course, we should also guide vocational students to actively participate in, and guide students to establish a good knowledge of learning English self-confidence. Why is solely on confidence in here, because after long-term teaching practice, I found, many high school students in learning English knowledge is not so positive, not so hard, because they have no confidence to really well in this course. Students in junior high school do not have very good English learning experience, and many of them are very weak in English. For many different reasons, students are becoming less confident in English learning. The lack of self-confidence has a negative effect on the efficiency of students' learning. More and more students will not only lack of interest in learning, even the knowledge of the English teachers in the course of time of fear into disgust, and the deterioration of relations between teachers and students, teachers to enhance the quality of the course is even more impossible. Understand the students of this psychological, how to help students build self-confidence to learn English well in front of us. I think the most effective strategies are two. First of all, appropriate to reduce the difficulty of the examination, so that students at the achievement level to achieve a certain sense of achievement. Students have achieved relatively satisfactory results; the motivation for learning will be more. Secondly, it summarizes the advantages of different students' English learning, and tells the students themselves that students can see their potential in English learning, and they will also establish a certain degree of self-confidence.

#### **4. Conclusion**

Improving the quality of English courses in vocational colleges is not an easy task. In the process of promoting this work, we need the three aspects of education, which are formed by vocational colleges, vocational English teachers and vocational high school students. Only when this resultant force is really formed can our dream be realized.

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