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Knowledge Creation**

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# When Stakes are High and Guards are Low: High-Quality Connections in Knowledge Creation

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## Abstract

We provide a first qualitative empirical investigation of the dynamics of high-quality connections in organizational knowledge creation through a comparative analysis of two organizations involved in management consulting and oil exploration. The study combines approaches from positive organizational scholarship with practice-based studies. We found three types of positively deviant practices for knowledge creation where high quality connections play a major role: 1) *Intensifying collaboration* is a response to felt urgency and mutual dependency in high stakes projects and involves expanding the types of interactions and the emotional intensity in knowledge creation. 2) *Caring questioning* unfolds when inviting, open-ended and appreciative questions enable joint dwelling on problems and stimulate help-seeking and help-giving. 3) *Getting physical* takes place when the making of collaborative space and use of shared visuals and artifacts enlarge the sensory-motor connectivity in knowledge creation. The paper contributes to both the literature on high quality connections and knowledge creation, showing how the two phenomena are mutually shaping in positively deviant practice. Unlike previous work on high quality connections we show how they are first of all ignited by the pull-dynamic of high-stakes projects, with caring questioning and getting physical as the fuel that keeps the fire burning.

Keywords: Knowledge creation, Learning processes, High-quality connections, Positive organizational scholarship, Care

## INTRODUCTION

What does knowledge creation in organizations look like when at its best? What are the relationships, if any, between particularly productive knowledge creation processes and the interactions that people consider energizing and enlivening at work? Literature on learning and knowledge creation in organizations has increasingly turned to practice as the site where such phenomena can best be investigated and understood (Gherardi, 2009; Nicolini et al., 2003; Orlikowski, 2002). Many researchers argue that current research does not go far enough in attending to the micro-processes of knowledge sharing and creation (Foss et al., 2010; Huysman & De Wit, 2004; Nonaka et al., 2006; Wang & Noe, 2010) including its embodied and relational nature (Nicolini, 2011; Shotter, 2006; Tzortzaki & Mihiotis, 2014). In this paper we extend the practice-based approach to knowledge creation in organizations by doing a first empirical exploration of the role of high quality connections (Dutton & Heaphy, 2003; Stephens et al., 2012) in positively deviant knowledge creation.

High quality connections (HQCs) are defined as short-term, dyadic, interactions that are experienced as positive and energizing by people (Stephens et al., 2012) and also suggested to have significant effects on work performance (Carmeli et al., 2009). Yet, the role of high quality connections in sharing and creation of knowledge is largely unexplored. We present a study across two cases: oil exploration and management consulting. These are sites where multidisciplinary sharing and combination of knowledge is much in demand and where it is intensely relational.

The paper makes two sets of contributions: (1) We expand the understanding of micro-processes of successful knowledge creation in organizations. (2) We contribute to the development of high quality connections as a construct for understanding knowing and learning in organizations. We proceed by reviewing the research on high quality connections in knowledge creation, before introducing the research setting and method and then moving on to the findings and their implications.

## HIGH QUALITY CONNECTIONS – THE MISSING LINK IN KNOWLEDGE CREATION

Why focus on high-quality connections in knowledge creation? Two main reasons stand out. First, and to paraphrase Dutton (2003b), every act of creating knowledge in organizations is not only a rational or utilitarian exchange, but an occasion where people may contribute to or drain the energy level of others. Dutton and Heaphy (2003)

distinguished high-quality and low-quality connections between two individuals based on “whether the connective tissue between individuals is life-giving or life-depleting” (p. 236). Any act of positive connecting in knowledge creation, whether exposing vulnerability in eliciting help from others or affirming someone’s input and efforts, may thus be seen as having the potential to enliven and create uplift in others (Hämäläinen & Saarinen, 2006). Focusing on high quality connections in knowledge creation opens up for attending to largely uncharted matters of reciprocity, emotionality and connectivity in the micro-practices of organizational knowledge creation.

Second, high quality connections are typically distinguished from relationships in that they may transpire on a single occasion, *or* within the context of an ongoing relationship. No enduring bond or association is assumed. Rather, they exist as micro-bits of interrelating at work that can contribute to a relationship over time, but are important in and of themselves (Stephens et al., 2012). The attention to the micro-practices of positive *connections* rather than relationships opens up for a process perspective – to study relationally responsive interactions (Shotter, 2006) as part of ongoing everyday work. It allows us to look at relations-in-the-making, their *doing*, rather than relations as states or assets, their *having*.

As a field of research, high quality connections was kicked off by a series of articles by Jane Dutton and colleagues just after the turn of the century (Dutton, 2003a; Dutton, 2003b; Dutton & Heaphy, 2003). It forms part of a larger relational turn in organization studies, in interactions (Shotter, 2006), knowledge creation (Tsoukas, 2009), formation of positive relationships more broadly (Dutton & Ragins, 2007), as well as relational dimensions of motivation (Grant, 2013; Grant, 2007) and being at large (Gergen, 2009; Sennett, 2012).

High quality connections have so far been defined by three structural characteristics and three forms of subjective experiences (Dutton & Heaphy, 2003, p. 266-277). The structural characteristics include: 1) a higher *emotional carrying capacity*, meaning that the connection has the capacity to “withstand the expression of more absolute emotion and more emotion of varying kinds”; 2) a higher *tensility*, meaning the “capacity of the connection to bend and withstand strain and to function in a variety of circumstances”; and 3) a higher degree of *connectivity*, meaning the relationship’s “generativity and openness to new ideas and influences.” The three essential subjective experiences are i) feelings of vitality and aliveness, ii) feelings of positive regard and of being known or being loved, and iii) felt mutuality.

The empirical research on high quality connections is still scarce but has shown promising results with regards to exemplifying positive outcomes. In one study of 212 part-time students Carmeli et al. (2009) found that both the capacities built into high-quality relationships and people's subjective experiences of being in such relationships are positively associated with psychological safety, which in turn predicts favorable learning behaviors. A study of 178 teams in the service sector found similar results (Brueller & Carmeli, 2011) with team learning also being positively associated with enhanced team performance. Another study of 218 service sector employees by Vinarski-Peretz and Carmeli (2011) found that felt care from co-workers cultivates psychological conditions (safety, meaningfulness, and availability) which result in a higher level of motivation and engagement in innovative behaviors. Finally, in a recent set of studies, Stephens et al. (2013) found that emotional carrying capacity were positively related to individual and team resilience, suggesting that emotional expressions in interaction is key to long-term virtuousness.

The studies cited so far are based on surveys that say little about the actual micro-processes of high quality connections in specific cases. They are variance type studies where practice tend to be abstracted into arrows between variables (Feldman & Orlikowski, 2011). The links to knowledge creation are all indirect, and the original conceptions from Dutton (2003b) and Dutton and Heaphy (2003) are not much challenged or expanded upon.

Focusing on positively deviant knowledge creation follows in a tradition of research that has studied knowledge sharing and creation as naturally occurring emergent practices, for example in copy machine repair (Orr, 1996), flute making (Cook & Yanow, 1993), claims processing (Wenger, 1998) or multidisciplinary problem solving in teams (Majchrzak et al., 2012). These studies all highlight communal aspects of knowledge creation though there is no direct treatment of the enlivening or energizing feature of connecting, nor much said about emotionality or reciprocity.

The closest we come to a direct parallel to high quality connections in the knowledge creation literature is probably von Krogh's (1998) conceptual account about care. Highlighting the fragile and personal nature of knowledge, von Krogh emphasizes that care in knowledge creation provides mutual trust, active empathy, access to help and courage. Following Polanyi (Polanyi & Prosch, 1975), Von Krogh (1998) argues that mutual bestowing of knowledge takes place as a form of *indwelling* where people go from "looking at" something to "looking with" someone. This conception of care was

paralleled by the notion of “ba” (Nonaka & Konno, 1998, p. 46), defined as a relational space (mental, virtual and physical) of “care, love, trust and commitment” from which knowledge creation may happen.

These conceptual relatives of high-quality connections in knowledge creation remain empirically underexplored (Choo & de Alvarenga Neto, 2010; Easa & Fincham, 2012; Gourlay, 2006; Nonaka et al., 2006). One exception is a quantitative study of team atmosphere in self-managed team, comprising 363 individuals from 12 firms (Zárraga & Bonache, 2005), confirming that high-care relationships favor both the sharing and creation of knowledge. Another is a qualitative comparative analysis of creative practices in six organizations showing the importance of help-giving and help-seeking in knowledge creation (Hargadon & Bechky, 2006). A more recent parallel includes research in the importance of giving behavior more broadly (Grant, 2013). Grant’s research is particularly interesting here because it expands upon notions of reciprocity in knowledge creation. All too often work relationships have been studied from a social exchange theory perspective in which questions of reciprocity are neglected (Davenport & Prusak, 2000) and relationships are considered mere means for exchanging resources (Dutton & Ragins, 2007). Grant (2013) offers a wider horizon for understanding giving behavior in where people contribute to the knowledge creation of others without expecting something in return. The potential downfall of not engaging in such giving behavior has been evidenced as loops of distrust that stifles creativity: what goes around comes around (Cerne et al., 2013)

In summary, with a few notable exceptions the literatures on high quality connections and organizational knowledge creation have not talked to one another. There is little research in the intersection of the two literatures that provide accounts of particular work practices. This paper aims to fill this gap by exploring the of role high-quality connections in knowledge creation practices – thus seeking to fulfill the promise of the HQC literature in attending to the “micro-contexts in which people acquire, develop, and experiment with new knowledge” (Dutton & Heaphy, 2003, p. 274).

## RESEARCH SETTING AND METHOD

We purposively sampled (Huberman & Miles, 1994) two organizations where knowledge creation processes form the core of everyday value creation and where they are intensely relational. *Explore* is the name we use for an exploration unit of a major oil company. This unit comprises around 35 geoscientists (out of 800 in the company at

large) and undertakes both near field and frontier exploration in the same offshore geological basin. All exploration activity takes place within projects, and combination of knowledge from subfields like petrography, seismology and sedimentology is necessary to build up high quality prospects for where hydrocarbons can be found. A series of recent discoveries, one spectacular, made it as particularly interesting unit to study in terms of successful knowledge creation. *Consult* is our name for a unit of a global consulting company. The unit in question has specialized in management consulting and employs ca 90 persons. Like *Explore*, all work at *Consult* takes place in projects with participants from several sub disciplines, e.g. economics, marketing or political sciences. An added feature in knowledge creation at *Consult* is that it typically involves client interaction, both in shaping ideas on *what* to deliver and *how*.

The research design we used was set up to elicit and compare stories of positively deviant practice in knowledge creation. High quality connections was not an initial focus of the study, but emerged in full force during a pilot round of interviews where people emphasized aspects of emotional intensity, energy and care. We combined a practice perspective (Gherardi, 2009; Orlikowski, 2002) with a positive deviance approach (Dutton, 2003a; Lavine, 2012), focusing on producing situated accounts of knowledge creation that organizational members believe stand out as particularly productive *and* enlivening. This is a non-trivial matter. Getting close to study work practices in project based organizations like *Explore* and *Consult* is a challenge due to the highly distributed nature of work as well as long project time cycles. Our approach emphasized engaging the reflective capabilities of people in the field in interviewing and analysis.

Our interviewing was informed by narrative approaches (Czarniawska, 2004; Kohler Riessman, 2008) as we set out to elicit stories of interactions in knowledge creation that organizational members believed stand out as particularly productive and effective. Appendix one details types of questions asked. We asked and listened for stories of high quality interactions (Q3 and Q4) within stories of positively deviant knowledge creation (Q2) within the context of the professional background of the employees and their organizational roles (Q1).

We conducted a total of 21 interviews, 11 with persons in *Explore*, 10 in *Consult*. All interviews lasted between 45 and 80 minutes and were transcribed verbatim. All were also conducted during site visits at the premises of the units, which allowed for observations about the physical infrastructure of collaboration, aspect of high quality connections that surfaced with surprising strength from the interviews and that are

missing from the HQC literature. In addition, one of the authors has a background in a multi-year action research project with Explore, providing both the impetus for access and for engaging practitioners in co-interpretation.

The main analytical approach took inspiration from a renewed branch of grounded theorizing (Charmaz, 2006; Suddaby, 2006) where constant comparison and repeated shuttling between empirical data and theory is seen as key to build theoretical categories. We emphasized trying to stay true to the reality of those researched and allow the informants to speak in their own voices through building first and second order categories (Gioia et al., 2013; Van Maanen, 1979). More specifically, we proceeded in the following steps (the coding is illustrated in the Appendix):

1. After transcribing the interviews we conducted a thematic analysis of the data into first-order concepts; thus building informant-centric categories..
2. We presented these first-order concepts back to people in both organizations, to member check and to elaborate on the categories. More than half our interviews also had such a feedback session towards the end. See Q5 in the Appendix.
3. We compared the first-order concepts across the two case organizations and were surprised to find how similar they were. We then we aggregated the categories into the three practices that we present here.

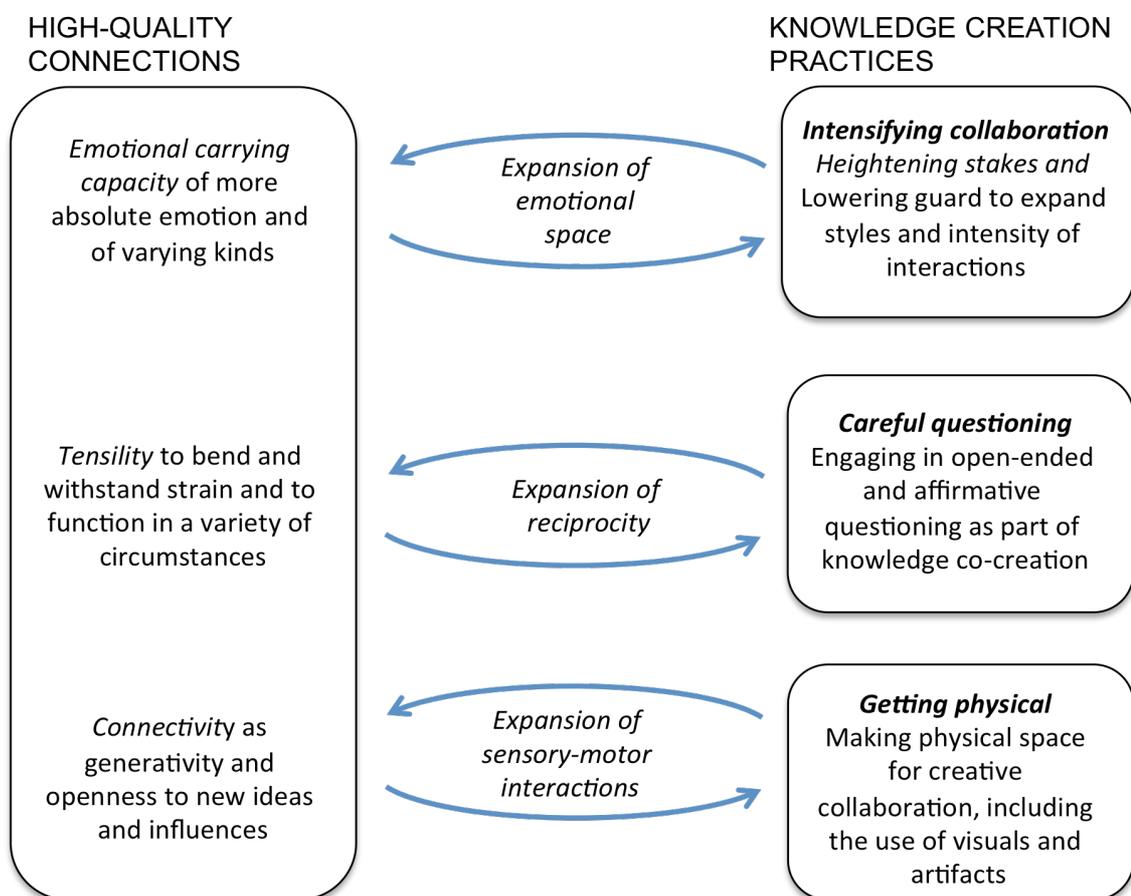
## FINDINGS – THREE PRACTICES OF KNOWLEDGE CREATION INFUSED BY HIGH-QUALITY CONNECTIONS

We found three types of positively deviant knowledge creation practices that are enabled by high quality connections and in turn also help build them. Figure 1 shows the relationship between these practices and the elements of high-quality connections that each of them *primarily* contributes to. Table 1 provides definitions. People at Explore and Consult emphasize how high-quality connections in knowledge creation first of all are experienced when *intensifying collaboration* in high-stakes projects, a practice that involves lowering the guards and expanding both the types of interactions in knowledge creation and their emotional intensity. A second practice, sometimes spurred by the first, is *caring questioning* where inviting, open-ended and appreciative questions enable joint dwelling on problems as well as help-seeking and help-giving. Finally, *getting physical* unfolds when the making of collaborative space and use of shared visuals and artifacts enlarge the connectivity in knowledge creation, thereby also enabling the two first practices. The three sets of practices all strengthen high-quality connections by, respectively, expanding emotional space, expanding reciprocity and expanding sensory-

motor connectivity.

It is intrinsic to Figure 1 that while we emphasize high-quality connections as a process phenomenon, there are elements that are remembered or otherwise made semi-permanent in physical infrastructure. We may say that these elements represent a particular form of what Hargadon and Fanelli (2002) called latent knowledge; relational elements of knowledge creation that are carried over from one context to another.

**Figure 1** *The dynamics of high-quality connections in knowledge creation*



**Table 1. Three practices defined**

<b>Practice</b>	<b>Definition</b>
<b>Intensifying collaboration</b>	<b>Expansion of emotional space and styles of interactions, fueled by a felt sense of urgency and mutual dependency.</b> This practice is typical for projects charged with compelling direction and strict deadlines. It involves more intense collaboration with more overlapping interdependent tasks, more flexible coordination and higher tolerance for emotionality and direct feedback than experienced in other projects.
<b>Caring questioning</b>	<b>Engaging in an inquiring, affirmative and open-ended questioning as part of co-creation of knowledge.</b> Core to this practice is the facilitation of shared attention to some joint problem, stimulating forms of help-seeking and help-giving that often takes place as an iterative, symmetric and synchronous exchange rather than with clearly defined roles and stages. Off-stage socializing and curiosity stimulate this practice.
<b>Getting physical</b>	<b>Emphasizing physical proximity and actively modifying and using physical space and artifacts in knowledge creation.</b> This practice includes making fragments of ideas, work efforts and solutions tangible in visuals to facilitate expanded and deepened connection between people and new combinations of knowledge.

### **Intensifying collaboration**

A particularly strong pattern in our data is that when people at Explore and Consult talk about high-quality connections in positively deviant knowledge creation, they typically do so in association with what they hold as high-stakes projects. High-stakes projects become arenas for intensifying collaboration for connecting and creating. The clearest example of this practice is from a major recent and spectacularly successful exploration project at Explore, the Aldus project. Aldus was set up to develop a part of a mature exploration area based on strong indications of large untapped reservoirs of oil. A competitor had challenged the request of operatorship and induced an urgent need to develop the field as soon as possible. Oil exploration typically involves a sequence of activities where exploration, discovery and mapping precede activities of commercial appraisal and development. In Aldus the teams found themselves in the unusual condition of “mapping other prospects, planning a new well, drilling the well and evaluating the well – all at the same time.” Two team members emphasized how the tough deadlines and high stakes were the primary driver of collaboration:

In Aldus we did the job faster. They wanted us to do that job in a year, when these things use

to be done in three years, so they needed to put more people into it. And then we needed to collaborate. Otherwise we would never achieve the goals in a year's time. [Pablo, Explore]

There was a huge workload (...) Information was coming in continuously, and it was really difficult to make sure that everyone was aware of what the others were doing, and what kind of information we were receiving. So you really had to find the person, and [laughs] almost grab them in the morning and say: "What's going on? What is happening?" (...) Some people feel more comfortable with not talking about their ideas at a very early stage. They want to have all the data; they want to have all the ideas in place before they feel comfortable to tell to someone else. Instead, in our team, there has always been from everyone very open communication from the beginning. [Marco, Explore].

Pablo's and Marco's experiences from Aldus illustrate how the practice of intensifying collaboration implies a common goal, time pressure, and a sense of urgency –conditions that resulted in more mutual dependency and intense collaboration. Due to the experience of participating in a high-stakes project, the explorers shared more knowledge and increased the frequency of their engagement to deal with more overlapping and interdependent tasks. When Marco had to "grab" his colleagues in the morning and quickly gather relevant knowledge, it is a consequence of a need for more flexible coordination. By having this intense and rapid knowledge sharing and coordination, Marco and his colleagues could give shared and iterative attention to data and their multiple interpretations rather than work in a traditionally (for that organization) distributed and sequential manner.

Along with the expanded interactional styles also came increased tolerance for conflict and emotion. Pablo talks about Aldus as one of the few projects where he could direct and "tough" in discussions with people without it having consequences. Other Aldus team members emphasize a form of interaction where they could quickly discard some ideas as not fitting the data while building on others. Heated discussions were possible without harming the relationship. Says Marco:

Of course, through time there has been some misunderstandings, and some small conflicts, but I think that it is the sort of conflicts you have also with very close friends sometimes. (...) So I think that we have some discussions in meetings and so on, and it was ending there – the same day and the morning after it is like nothing had happened. So I think it is mainly because of the respect that we have for each other [Marco, Explore].

What we see here is that knowledge creation in the Aldus was enhanced not only by high emotional carrying capacity, as the members expressed tolerance for more positive and negative emotions. Enhanced *tensility* in the team allowed the relationships to "bounce back" after setbacks or fights. There is also a more general pattern in that team members talk of an unusual enjoyment of collaboration where feelings of mutual dependency also came along with more care. These feelings of mutuality and positive

regard seem to come hand in hand with the general aliveness of participating in something where there is much external attention.

In exploration things are often so far in advance that there is no motivation to do things quickly. (...). But we are in a position now where the field that we are drilling is under development (...). We have for instance identified something like an upside potential to this discovery. It's not approved yet, and it may not come to anything. But the point is that when we do that, we know that we have the potential to drill it quite quickly, and so that makes you feel really alive. [Brad, Explore].

The stakes in the project are accentuated by the magnitude of potential rewards, the amount of attention from internal and external stakeholders and the felt urgency with regards to time scope. Moving on to Consult we see much of the same pattern. High-stakes projects seem to be breeding grounds for high-quality connections. Vetle, a young analyst in Consult, tells of a successful project in the public sector, and how the relationships between team members became stronger during periods of overtime:

The challenge was to train hundreds of end users within the final deadline. (...) It is during those times when you feel pressured, when the whole project is pressured, that is when you see how things really work. (...) More intense, longer days, more evenings. You can feel the dependence to your team-members. [Vetle, Consult]

Like in Explore the long hours and intensity of collaboration led to expanded interactional styles and extension of relationships from being colleagues to becoming friends. Time pressure and stress may thus lead to social bonding and the development of high-quality connections. Again, in the words of Vetle:

You start talking together like friends. You bond more. And when you work long hours... Well, I don't know if it is because you get so tired, but the guards go down. We had a lot of dinners together, so you get the social aspect. And suddenly you know what everyone in the team does, because the few hours you have to yourself, when you are not at work, you talk about those too. [Vetle, Consult].

We cannot from these observations alone make any claims that high-stakes projects will always lead to high-quality connections. What we can say is that there seems to be a strong pull-dynamics for the formation of high-quality connections from projects with dramatic intensifiers (Carlsen, 2008) like high rewards, short time duration, competitive pressure and high external attention. It seems likely to suggest that these pull dynamics are further accentuated by the experience of making progress (Amabile & Kramer, 2011) as all the examples here are from events considered success projects. The pull dynamics used for intensifying collaboration are accompanied by stronger in-group bonding and lowered guards for both types of team member interactions and their emotional intensity.

## **Caring questioning**

Our second major finding is a set of practices that supports and extends the observation made by Hargadon and Bechky (2006) on the centrality of help-seeking and help-giving behavior in knowledge creation. Like Hargadon and Bechky, we find that these relational practices are key to sharing and combining knowledge across organizational and disciplinary borders. The added feature that we also see in our data is that such help-seeking and help-giving is often stimulated by, or is embedded in, processes of *caring questioning*. This is clearest to see in the case of a seasoned explorer we call Philip, a person we have witnessed in interactions and who is mentioned by many of his colleagues as particularly helpful. What is it that Peter does so well? One of his colleagues puts it like this:

He is the definition of a supporting colleague. He is nailing stuff into the nitty gritty detail. He asks all the “why-questions”. (...) We don’t have enough knowledge to understand everything, so when we were presenting we got the feedback that we had interpreted a multiple, and then we were like “what do we do now?” We had to go back, start all over again with a new prospect. Then Philip asked: “how do you get the extension to work like this?” - and then we discovered that this wasn’t sensible. [Kari, Explore].

When asked to talk about his favored ways of connecting in projects, Philip himself offers the following explanation:

People need to have the answer themselves. (...) It is important that they figure it out on their own, rather than to have me tell them (...). It may be time consuming, but I believe that people get more out of that, instead of you telling them arrogantly, “this is the way it is” (...) I believe that breakthroughs [in exploration] happen when you combine people who have deep knowledge within an area with new people that don’t have this knowledge. If these inexperienced new people have the right attitude, they will ask a lot of questions, “stupid” questions. And then the people with the deep knowledge, they may think that they have the answers to everything, but no they don’t. Suddenly they discover a connection they were not aware of. [Philip, Explore].

It seems fair to suggest that what is talked about here are not occasions where people come in with well-defined problems to which their colleagues can offer ready-made solutions, nor a process with clearly defined roles and stages. Rather, we hear about a type of behavior where Philip and the people he interacts with use questions to invite attention to some joint problem where help-seeking and help-giving is needed. He asks questions and listens in a caring and energizing manner. Philip represents the anti-thesis of argumentative talk and uses several of the strategies for high-quality connections that Dutton (2003b) has labeled “respectful engagement”, in particular being genuine (showing vulnerability and acknowledging difficulties), using supportive communication (inviting rather than arguing) and conveying affirmation (believing and conveying that people have the answers themselves) .

Philip's ways are mirrored in the accounts from consultants at Consult that are considered particularly good at client relations, such as Marius. He emphasizes the importance of the perhaps most cherished of all strategies for respectful engagement (Dutton, 2003b) – that of active listening:

Then we basically just sat down and listened to how they were working on things day-to-day. We tried to find out the problems and frustrations they had. I think that is one of the reasons the project was such a success. They felt like they were taken seriously. It was not just someone that told them: “this is the solution”. (...) We just dived in there with an open mind talking and listening to people, formally and informally. [Marius, Consult]

These are types of exchanges that are perceived as valuable to all parties and inherently mutual and life-giving. Receivers of help are being seen and believed in, while givers reap the rewards of feeling valuable and important. The resultant kind of reciprocity involved here is not so much a sequential succession of distinct events involving alternate episodes of giving and taking (Grant, 2013) as a symmetric and iterative exchange where both set of behaviors happen simultaneously, a semi-permanent connection fueled by caring questioning.

The practice of caring questioning is key to positively deviant knowledge creation in both Explore and Consult, though with some variation. Explorers typically emphasize that the importance of curiosity and arenas for informal social exchanges and low threshold interactions. This may be seen as an escape from conventions in formal review sessions and meetings where people present more or less finished prospects that other then respond to. Says Torgeir:

The best ideas are created in the morning, when you are out here drinking coffee. You just think of an idea: “maybe we should take a look at this?” (...) [in informal settings] the barriers are lower. (...) If you have a formal, arrogant setting - as I felt when I worked in another location, it was like you got frowned upon for proposing something new. Well, then you stop proposing. If there are no barriers you have so much more to work with. [Torgeir, Explore].

What is valued here are “silly meetings”, “technology coffees”, and other forms of more informal work session where people are given an opportunity to voice questions and look at data and preliminary interpretations together. Small problems and issues from ongoing work can be put on the table, then caringly questioned to get immediate response. There is a parallel here to Von Krogh's (1998) notion of connections that allow for indwelling in terms of *looking at things together*. More formal presentations connote a regime of evaluators looking at people, not with them.

People at Consult emphasize the dynamics between building informal relations and past instances of caring questioning as key to high-quality connections. One

example comes from Viktor, talking about how he got access to information that proved a breakthrough in a project:

When we were done with the formal program we were up late and then people began talking about what they really cared about. And that was that a competitor was starting to capture pieces of their market share, and they were scared that they could not match that model.

Viktor goes on to use the information to provide an analysis and a first possible solution to the administration of the client:

When I presented my solution to the client, and asked: “Is this a fair representation of your problem?”, they were speechless and said “How did you managed to do this?” and I answered “Well, I listened to you” [laughs]. [Viktor, Consult]

Here the decisive connection comes in an informal setting where people interact backstage and have somehow escaped formal role expectations of the client relationship.

Ida offers of a complementary story of an interaction believed to have lasting impact on relations throughout a project:

I invested a lot of time in being available so they could ask me, or use me to test the technical solution. I remember a night I was in the office. The clock was 8pm and one in our team (from the client side) logged on the system. He wore an apron and he was cooking in his kitchen at home, and he said: “Can we test the technical solution while I’m boiling potatoes?” And I said: “Yes, sure we can!” - and then we just sat and tested the solution. It was like trial and error without any stress, and he knew that I was available. (...) After that episode something happened in our relation, and in the team. [Ida, Consult]

Again we see the importance of prolonged active listening and the mutuality of the exchange. Here we are also reminded of the importance of conveying presence (Dutton, 2003b) both in terms of demonstrating availability and flexibly tuning in to the situation of the other. We also see a contagion effect in the sense that the experience of reciprocity of caring questioning in one setting carries over to other settings.

In summary, caring questioning involves an open-ended and symmetric bout of knowledge creation where guards are lowered, vulnerability is shown and help-giving and help-seeking can take place. Repeated caring questioning may be regarded a succession of BA-s (Nonaka & Konno, 1998) in the sense that it is a transient space for knowledge creation marked by care. It is often also a physical space.

### **Getting physical**

A surprisingly vital dimension of positively deviant knowledge creation at Explore and Consult is how people get physical in fostering high-quality connections. What is surprising here is not that there is a physical dimension of knowledge creation but that the physicality is seen as decisive in high-quality connections. The primary function of

getting physical in our case material is to expand connectivity between people in a way that deepens and energizes their knowledge creation. This takes two main forms.

First, getting physical is an important way of establishing trust and facilitating those first exchanges that pave the way for later productive sessions of knowledge creation. This pattern is particularly evident at Consult where successful knowledge creation, seems to demand the prior experience of meeting physically:

When you sit close to the client it is much easier to get information about frustrations and to develop a closer relationship. You become the trusted advisor. (...) I feel like physical proximity is what is needed. It gives a totally different form of knowledge transfer, participation and engagement. [Marius, Consult].

We sit together with the client. That is one of the things that create a good client-consultant relationship. We try to avoid the impression “we are from Consult, and you are the client”, and rather work together as one team. [Frank, Consult].

One element of the physical co-location seems to be to create a symbolic perception of equality and commitment to colleagues or clients, even if just passive face time (Elsbach et al., 2010). Again, a key element here is conveying presence (Dutton, 2003b). Frank and Marius signal that they are available and accessible. Initial face-to-face encounters pave the way for later connections through digital media.

Physical proximity is also valued at Explore, in particular during the early phases of large projects that cut across organizational borders. For example, the ease of informal coordination and intense collaboration that took place at Aldus was much helped by sharing facilities. Knowledge creation that require rapid and iterative interactions is highly vulnerable to even small increases in physical distance between actors (Allen, 2007). This brings us to the second main point of this practice: getting physical enables high-quality connections by expanding the sensory-motor engagement of interactions. Getting physical allows people to share knowledge verbally, non-verbally (gesticulating) and visually (sketching, using objects). Three examples:

We had one [successful] project where we were three girls working on seismic interpretation and we were sitting next to each other so we had the backs to each other and that was really good because then we always talked, and if we saw something on the seismic we just turned around and said “ah, look at this!” and “what do you think of this?” and I think that was one of the most effective methods because none of us felt they would disturb the others and we were just blurring out ideas, we made posters, and noted down ideas, and I think that was probably the best collaboration I’ve had so far. [Sara, Explore]

It’s about being able to gesticulate, underlining, not saying. You end up using words to make points when you would normally just move your arms. [Vetle, Consult].

When we had decided to go for a solution we invited a customer in the bank to test the solution. We asked the customer “does this work?”, and then we discussed it afterwards. It could be simple things such as “did you see the picture?”, “did you hear the sound?”, or

“was the content adjusted to your needs?” Then you get a clear indication on whether things are working according to the plan. [Ida, Consult].

These examples testify to enlargement of the communicative space in multimodal synchronous interactions that also involves sensing, seeing and hearing. The sensory richness of interactions seems particularly important in creation of complex knowledge that require spontaneous and informal sharing (Elsbach & Bechky, 2007, p. 80) across boundaries. The ways of working that people refer to here are not about conveying results, but sharing half-worked ideas. It is a sharing that is particularly visually intensive at Explore, where it is aided by digital and low-tech devices – *and* gesturing:

You need big rooms, with big screens, 3-4 meters. So that everyone can sit together and look at things at the same time. (...) A meeting room like this, but everyone has their own desk with their own screens. The screens are linked. So that if we work on the same thing [demonstrates by pointing to his screen, simulating]: “I don’t get this”, then we can put it on the big screen, take two minutes and discuss that part. [Per, Explore].

The way the room is designed is very important. (...). You need a notepad where you can sketch opportunities, sketch ideas - and walls, a wall where you can hang things. And whiteboards. It is about getting the ideas up and out there visually (...) Speaking, drawing, making mistakes - people pay more attention to that than in a glossy presentation where everything is already decided. (...) It’s about others being able to take your pen, that the pen is passed around. [Fredrik, Explore].

The experiences referred to here are supported by research showing the importance of visuals and artifacts in synchronous knowledge creation (Israilidis & Jackson, 2012), particularly studies underlining the unfinished nature of “epistemic objects” (Ewenstein & Whyte, 2009; Knorr Cetina, 2008) where objects, sketches and diagrams are used to show tentative work – fragments of solutions and scaffolds in the making (Majchrzak et al., 2012). It also aligns with research on gestures as a direct and less mediated way of embodying and conveying knowledge (Tversky et al., 2009 , pp. 130-131). The added dimension offered in this study is that getting physical is a direct way of establishing high-quality connections, not something that is distinctly before or after it but forms part of the same relational and performative totality. Getting physical facilitates the respectful engagement (Dutton, 2003b) of active listening, conveying presence and communicating with invitation and the visualizing of progress (Amabile & Kramer, 2011) in knowledge creation. In sum, getting physical is important because it helps build connections and constitutes events of seeing (Belova, 2006), touching and discovering together.

## CONCLUSIONS

We have in this paper presented a first empirical investigation the role of high-quality

connections in positively deviant knowledge creation through a qualitative comparison of practices in hydrocarbon exploration and management consulting. The three sets of practices identified - *intensifying collaboration*, *caring questioning* and *getting physical* – all tell about ways of working that has the dual quality of creating new knowledge while also building high-quality connections. Thus, they are simultaneously experienced as productive and enlivening. They achieve this dual function by, respectively, enhancing emotion carrying capacity, reciprocity and sensory-motor connectivity in knowledge creation. In short, people experience being more productive and alive in knowledge creation when there is room for more emotionally intense and overlapping interactions, when an open-ended and respectful questioning expands reciprocity in interactions and when connectivity is helped by the sensory richness of proximity and more use of visuals and tangibles in synchronous interactions.

To the literature on high-quality connections our study contributes with a deepened understanding of how such connections can be built and sustained through activities of knowledge creation. The practice of caring questioning *confirms* the importance of the of micro-strategies for respectful engagement as conceived in the original account by Dutton (2003b). The practice of intensifying collaboration and getting physical *extends* the understanding of how high-quality connections are enabled: They are perhaps first of all ignited by the pull-dynamic of high-stakes projects. Likewise, and also not explored previously, they are heavily conditioned by the materiality of gestures, space and use of artifacts in interactions.

To the literature on knowledge creation this research adds to research on knowing in practice and strengthens the understanding of its relational dimension, in particular with regards to themes with little prior treatment; emotionality, reciprocity and connectivity. The paper fills a gap of exploring local knowledge creation practices (Nonaka et al., 2006) by extending and further investigates the hitherto empirically modestly explored notions of Ba (Nonaka & Konno, 1998) and care (Von Krogh, 1998).

Our research is enabled by sampling that allows for comparison between to settings for knowledge creation that represent useful contrasts with regards to types of disciplinary knowledge, networks and outputs. The engagement of people in the field in analysis and the multiple views on some of the same event (projects, meetings) in the two organizations are also strengths. There are also limitations. For further exploration of the micro-processes of HQCs in knowledge creation, it will be important to get closer to practice and sample from a broader array of organizational settings.

Finally, for managers and other practitioners who aim to better enable knowledge creation, this research points to its inevitably collective nature and has an optimistic message: Every act of creating knowledge is potentially also an act of building high-quality connections that in turn will help create knowledge better and faster. These are small acts with potentially big impact. Possibilities for such positive dynamics can increase when stakes are high. Our job is to accentuate these stakes while also trying to open the space through caring questioning and getting physical – thereby lowering the guard.

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## APPENDIX 1 INTERVIEW GUIDE

Question themes	Specifics
Q1: Background of interviewees	Questions about the educational, professional and personal backgrounds of interviewees. Follow up questions would centre on motives for choice of work and sources of engagement.
Q2: Successful projects and breakthroughs	Open-ended questions about specific projects or events that organization members see as having been especially successful. Follow-up questions would deal with turning points, peak moments and details of practice.
Q3: Connecting at work	Questions about collaborating and connecting to others in the events above. Here follow-up questions would be more directive, asking interviewees to compare across projects and teams.
Q4: Sources of deep engagement meaning	Questions about aspects of work and episodes from work that provide employees with a sense of fulfillment, pleasure, and satisfaction. Follow up questions would centre on the collaborative and physical context of such episodes.
Q5: Reflections on patterns	A reflective part typically starting with brief presentations of preliminary interpretations and patterns from interviews, followed by discussions about alternative interpretations.