



The Sociological Theory of Craftsmanship: An Empirical Test in Sport and Education

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Thorolfur Thorlindsson

University of Iceland, Iceland

Vidar Halldorsson

University of Iceland, Iceland

Inga Dora Sigfusdottir

Háskólinn í Reykjavík, Iceland

Abstract

The aim of this study is to test empirically the sociological theory of craftsmanship originally developed by C. Wright Mills, Torstein Veblen, and Howard Becker and later extended by Harper, Sennett, and Fine. We conduct a quantitative analysis based on a nationally representative sample of 10,783 Icelandic adolescents (50.2% girls). We developed a scale measuring craftsmanship that we use to test several hypotheses regarding the role of craftsmanship in sport and education. Our findings provide a consistent empirical support for the theory of craftsmanship. First, they indicate that elements of the craftsmanship theory that have been identified by prior qualitative research go together as predicted to form a coherent theoretical construct and a measurement scale that is both reliable and valid. The craftsmanship scale therefore offers good opportunities for quantitative research in an area that has been exclusively qualitative. Second, our findings indicate that, as predicted, the craftsmanship approach makes schoolwork more meaningful and reduces general feelings of meaninglessness. Third, the findings show, as predicted, that the craftsmanship approach influences school performance in a positive way. Fourth, we find that the positive relationship between sport participation and school performance is in part mediated by craftsmanship. Finally, the findings show that the influence of craftsmanship on school performance is in part mediated by meaninglessness. We discuss the implications of the findings in light of sociological theory, culture and the social context of education and sport.

Corresponding author:

Thorolfur Thorlindsson, University of Iceland, Oddi v/Saemundargata, Reykjavík 101, Iceland.

Email: thorotho@hi.is

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Introduction

Sociologists have developed detailed theories of craftsmanship. They have produced a considerable amount of empirical work, consisting of qualitative case studies and ethnographic work, that identifies some of the distinctive cultural and organizational features of the craftsmanship approach (Becker, 1978, 1982; Fine, 1996; Harper, 1987; Mills, 2002 [1951]; Sennett, 2008; Thorlindsson, 1994; Veblen, 1914). This research reveals that the culture of craftsmanship is characterized by holistic understanding, informal learning, intrinsic motivation, tacit knowledge, and problem-finding and problem-solving that are part of the same process (Harper, 1987; Mills, 2002 [1951]; Sennett, 2008). The social organization of craftsmanship resembles a well-organized workshop (Harper, 1987; Sennett, 2008: 53–55; Thorlindsson, 1994). It centers on informal networks and authority that is based on skill and experience and nested in a community with a shared task-oriented focus.

Sociological research on art and various domains of work suggests that the craftsmanship approach is highly effective (Becker, 1978; Fine, 1996; Harper, 1987; Mills, 2002 [1951]; Sennett, 2008; Thorlindsson, 1994). Mills (2002 [1951]) argues that it has considerable advantages over more bureaucratic approaches. Research on sport suggests that individuals who are intrinsically motivated and train in a social context that emphasizes play and holistic understanding of the game are likely to succeed and become elite athletes (Halldorsson et al., 2012, 2014).

The sociological theories of craftsmanship overlap with theories that emphasize active task-oriented learning based on play, practice, intrinsic motivation, experimentation, flow, and holistic understanding. Some of these theories have at one time or another found their way into the formal educational system. Thus, Piaget (1950, 1965; Piaget and Inhelder, 1969) placed play and activity at the center of the cognitive development of everything from basic concepts of science to the moral thought of the child. Influential American pragmatists, such as John Dewey and George Herbert Mead, approached learning from a theory of knowledge that emphasized play, activity, and experimentation as the basis for both knowledge and learning (Dewey, 2017 [1916]; Mead, 1972 [1934]).

The emphasis on task-oriented active learning may be contrasted with a more formal authoritarian and bureaucratic approach to learning that characterizes some modern school systems (Collins, 1979; Davies and Guppy, 2010: 158–177). This approach relies on fixed curricula and standardized procedures and outcomes (exams and credentials). Schools are increasingly governed by general rules that define hierarchical lines of control and responsibilities as they move from traditional to more rational-legal types of authority (Davies and Guppy, 2010). Schools have gradually become a world of flow charts and predictable scheduling, where students are seen as ‘clients’ and the teachers are experts with formal credentials to teach and diagnose learning problems. In short,

schools are in many respects becoming an ideal-typical bureaucracy in the Weberian sense (Davies and Guppy, 2010).

These two opposing camps of school-based learning are presented here as ideal types in the Weberian sense of the word. They do not capture the complexity and various ways of learning in today's schools. Rather, they present two polar approaches to acquiring the basic knowledge and skills that schools should provide. The modern school system in Western countries incorporates various philosophical traditions and different policy elements. It has developed in recent years to offer more individual choices for parents and students. The quest for programs that are tailored more toward individual students and the right of parents and students to select between programs and schools are examples of this trend. Thus, while the modern school may look like a rather rigid bureaucratic institution, it offers a lot of institutional and individual latitude and flexibility. There is considerable variability within schools, both among teachers and students, in skills and attitudes toward learning. Elements from various camps and theories of learning are present to some degree in the modern school system. To what extent individuals rely on active learning or follow a more authoritarian and passive approach to schoolwork is an empirical question.

Interestingly, all the sociological work on craftsmanship cited above is qualitative. We are not aware of any quantitative research on craftsmanship. Here, we attempt to fill this gap and examine the role of craftsmanship in schoolwork using a nationally representative sample of adolescents in Iceland. To accomplish this task, we developed a scale consisting of eight items, measuring craftsmanship. The construction of the craftsmanship scale is an important contribution to the literature for two reasons. First, it offers the opportunity to test how key elements that have been seen as constituting aspects of craftsmanship go together empirically to form a coherent theoretical construct. Second, it opens up numerous possibilities to conduct quantitative inquiry in the field of craftsmanship to complement the existing body of qualitative work. We use the craftsmanship scale to test several hypotheses regarding the role of craftsmanship in sport and education.

Halldorsson et al. (2014) suggest that youth sport in Iceland is characterized by craftsmanship, stressing play, skill, and intrinsic motivation rather than outcome. These characteristics of Icelandic sport offer a unique opportunity to explore to what extent the documented relationship between sport participation and school performance (Kristjansson et al., 2010; Sigfusdottir et al., 2007; Thorlindsson et al., 1994) is mediated through craftsmanship. Studying craftsmanship in this context provides a comprehensive examination of the sociological theory of craftsmanship and offers a good opportunity to test the reliability and validity of the new craftsmanship scale.

We present our article in five parts. First, we discuss the theory of craftsmanship and its uses in sociological analysis. Second, we discuss craftsmanship in relation to sport participation and education. Third, we discuss methodological issues. Fourth, we present our statistical analysis using structural equation modeling (SEM) and calculated probabilities. Finally, we discuss the findings in the context of sociological theories of the culture of craftsmanship and the social organization of sport and schoolwork.

The sociological theory of craftsmanship

Most of the formal definitions of craftsmanship that have been offered refer to craftsmanship in its abstract form. Thus, Sennett (2009) defines craftsmanship as ‘... an enduring, basic human impulse, the desire to do a job well for its own sake’ (p. 9). In a similar vein, C. Wright Mills (2002 [1951]: 220–221) maintains that the laborer with a sense of craft becomes engaged in work in and for itself. Craftsmanship represents ‘the human condition of being engaged’ in the task at hand (Mills, 2002 [1951]: 220–221). These definitions are not detailed enough to be convenient for quantitative research. But the qualitative research on craftsmanship offers a wealth of material that can be used to develop a definition that can be used for quantitative inquiry. These studies cover various fields of work that vary in their content and in their emphasis on different aspects of the craftsmanship approach. Becker’s (1978, 1982; Faulkner and Becker, 2009) analyses of the social production of music, Berger’s (2003) analysis of the ethic of excellence in classroom teaching, Mills’ 1980 [1952] work on intellectual craftsmanship, Fine’s (1996, 2003) analyses of culinary work, Gawande’s (2008) description of the work of surgeons, Harper’s (1987) account of Willie the all-round craftsman, and Thorlindsson’s (1994) work on fishermen are examples of the diversity of research on craftsmanship. Taken together, these works provide a fairly comprehensive and consistent approach to the understanding of theories of craftsmanship in work, art, and science. A close look reveals that the practice of craftsmanship presented in all these cases has a common core that offers a wealth of material to build on for quantitative empirical research. Drawing on these studies, we offer the following definition of craftsmanship: Craftsmanship is an approach that is characterized by intrinsic motivation, engagement in the task at hand, holistic understanding, emphasis on informal learning, and the honing of skills that are needed to accomplish the task at hand. (Becker, 1978, 1982; Berger, 2003; Crawford, 2010; Fine, 1996, 2003; Gawande, 2008; Harper, 1987; Mills, 2002 [1951], 1980 [1952]; Sennett, 2008; Thorlindsson, 1994; Veblen, 1914). This definition, which refers to the characteristics of craftsmanship independent of context, makes it possible to use the hypothetico-deductive method to test several key hypotheses by quantitative methods for the first time.

In this context, it should be pointed out that developing a quantitative analysis of craftsmanship, which builds closely on existing qualitative research, presents some theoretical and conceptual challenges. Qualitative research is usually very context-bound. It often deals with specific cases, situations, or small group activity that is related to a particular place. Qualitative research often proceeds in an inductive manner, where theories and concepts are developed gradually in a descriptive way. They take on meaning in the context of a particular case, highlighting its uniqueness.

Quantitative research, on the other hand, is more context-free. It seeks to develop generalization and statements that describe relationships between variables. It is usually conducted in a deductive way laying out the theory, defining and operationalizing concepts before forming hypotheses, and testing them empirically. The analytical style of quantitative research demands conceptual clarity. Concepts should not overlap but should be meaningfully separated from each other.

Furthermore, the craftsmanship theory itself is a theory that is rather context-bound in the sense that it postulates a particular workshop-like social setting that is characterized

by informal relationships and authority based on skill and experience (Berger, 2003; Crawford, 2010; Fine, 1996, 2003; Gawande, 2008; Sennett, 2008: 53–55; Thorlindsson, 1994). Craftsmanship is nested in the community of workers and organized around the workplace. This context-bound nature of craftsmanship theories implies that the defining characteristics of craftsmanship come together in various ways when they are contextualized in different social settings such as the fishing boat, the restaurant, the school, or the sport club. We must also recognize that these defining characteristics of craftsmanship mix with more instrumentally motivated activity and standardized procedures in most contemporary social groups and institutions (Fine, 2003).

The culture of craftsmanship

The craftsmanship approach is driven by a specific culture. Key characteristics of this culture are intrinsic motivation, the emphasis on the task at hand, and the standards of evaluation, which are built into the task. The craftsman focuses on the ‘objective standard of the thing in itself’ (Sennett, 2008: 9). The craftsman is dedicated to the work for its own sake. Harper’s (1987) analysis of Willie the all-round craftsman demonstrates this point well. Work is seen in terms of its challenges and rewards (Harper, 1987: 145–146). Willie’s peace of mind comes from his engagement in his work. Free from outside scheduling, he can concentrate on means rather than ends. As he observes,

If you rush through things you can’t enjoy them. And it’s a challenge—no job is the same. If you had a thousand jobs in a year, not two of the thousand jobs would be the same. Even the ones that are supposed to be the same aren’t. Things are broken or worn in different ways—they each have their own characteristics. (Harper, 1987: 169)

The second, key characteristic of the culture of craftsmanship is the holistic inductive approach. Harper’s (1987) analysis shows how Willie utilizes his ‘many-sided knowledge’ of material and his holistic understanding of engines and all kinds of machines to repair them and seek creative solutions to solve practical problems. His holistic understanding of engines and mechanical objects allows him to fix mechanical things by re-designing them. Designing, producing, improving, and fixing are part of the same process. It is this holistic approach that helps Willie come up with creative, and often unique, solutions to problems. In a similar way, C. Wright Mills (2002 [1951]) argued that the transformation from work generalists to specialists had some important negative consequences. Increasing standardization and the associated loss of holistic understanding and alienation of workers has replaced the traditional methods of the general craftsman, resulting in decreased workers’ motivation and experimentation.

The third key characteristic of the craftsmanship approach is its emphasis on the skill involved to complete a task. All the researchers who discuss craftsmanship see this aspect as crucial. Becker (1982) emphasizes this element of craftsmanship, arguing that the artist-craftsman’s approach consists of developing skills to produce things or perform certain tasks (e.g. music) rather than making money or winning (as in elite sports). Sennett (2008: 20–21, 37–47) points out that craftsmanship is founded on skill that is developed to a high degree. He warns, however, that although skill is a key characteristic

of craftsmanship, the focus on manual skill and technique as isolated phenomena leads to one of the most common misunderstandings about craftsmanship. Skills have to be developed to the level of mastery so that they can be applied to problem-finding and problem-solving. Once the stage of mastery has been reached, people are free to develop their craft and apply their skill in a creative way to find and solve practical and theoretical problems. Sennett (2008: 20–21) argues that it is the connection between skill and imagination, between technique and science, between the head and the hand, that is the key to the craftsmanship approach.

Craftsmanship: social organization and forms

The medieval workshop was an environment characterized by informal relationship and authority based on skill and experience (Sennett, 2008: 53–55; Thorlindsson, 1994). Craftsmanship is seen as having thrived in the community of the workshop, where efforts were collaborative and work was the product of cooperation, rituals, and formal gestures. Each individual's work was constantly discussed and commented on by co-workers who relied on each other's performance. This context where the various components of craftsmanship were brought together in a coherent whole no longer exists, but some of them are found in contemporary ways of organizing social activity. Thus, the distinction between activity that has a value in itself, is intrinsically motivated and aesthetically evaluated, and activity that is instrumental and evaluated by outcomes does not exist (Fine, 2003). Individuals rely on intrinsic motivation to various degrees. Standards of quality are not inbuilt into the task to the same degree that they were. The focus has shifted more toward outcomes. Many work and learning situations today are mixed, involving both measures of outcomes and internal quality control. As Fine (2003) points out, most types of work involve both expressive and instrumental components. Aesthetics constitute, in various degrees, a part of most work, but they must be taught and learned (Fine, 2003).

The culture and the social organization of the medieval workshop provided an ideal type for the craftsmanship approach. Today, the situation is completely different. Some elements of the culture of craftsmanship have mixed with modern approaches of standardization and the emphasis on instrumentality and outcomes. The school is an example of a social institution that incorporates elements from these distinct traditions. How they mix together in various social contexts in the modern school is an empirical question.

Theoretical expectations and major hypotheses

The theory of craftsmanship makes some clear predictions that allow us to form hypothesis both to estimate the construct validity of the craftsmanship scale and to develop more complex theoretical models involving craftsmanship. Construct validity is a 'theory-based' validation. It involves both the validation of the measurement instrument and the underlying theory of craftsmanship. We begin by discussing key theoretical links that serve as a validation of our craftsmanship scale.

The meaningfulness or the meaningless of work is an important element in the craftsmanship theory. The literature suggests that one of the advantages of the craftsmanship

approach over more instrumental and bureaucratic approaches is that it reduces meaninglessness (Becker, 1972; Berger, 2003; Mills, 1980 [1952]). The general idea is that bureaucratic overregulation of the modern school stresses elements that produce alienation. First, bureaucratic approaches that have been introduced into the modern school tend to favor standardization and fragmentation of tasks, which results in alienation and meaninglessness of work (Mills, 1980 [1952]). The holistic and active approach implied in the craftsmanship approach makes work more meaningful. Thus, Mills (1980 [1952]) argues that breaking down the craft of teaching and learning in social science into separate and often isolated components (methods, theory, and so on) is a poor way to train competent social scientists.

Second, focusing on means rather than outcomes makes work more meaningful (Becker, 1972, 1982; Davies and Guppy, 2010; Sennett 2008). The school, on the other hand, according to Becker (1972), is characterized by fixed curriculum and an emphasis on outcomes in the form of standardized tests that makes it a ‘lousy place to learn anything in’ (for a more recent discussion, see Davies and Guppy, 2010).

Third, Becker (1972) also holds that one source of meaninglessness in the modern school system is its isolation from real-world tasks. Also, school has become an institution that has transferred the responsibility for students’ learning from the students to the teachers. Both Becker and Mills attribute meaninglessness specifically to the organization of the modern school. Mills (1980 [1952]) also suggests that meaninglessness is more of a general problem that is rooted in the alienation of work, increased specialization, and the fragmentation of social life. In the light of this, we employ two measures of meaninglessness: one scale that reflects the school context and another that is a general measure of meaninglessness unrelated to a specific context:

Hypothesis 1. (a) Students who rely on the craftsmanship approach experience less ‘general meaninglessness’ than those who do not. (b) Students who rely on the craftsmanship approach experience less school-related meaninglessness than those who do not.

Several scholars have suggested a close empirical relationship between craftsmanship and sport and play (Chambliss, 1988; Halldorsson et al., 2014). Pragmatists, such as Dewey (2017 [1916]), saw play as a free and intrinsically motivated activity. Dewey maintained that it was one of the drawbacks of the modern economic system that it had reduced play to the status of idle excitement, while work had become a means toward an end.

Research on sport in Iceland (Halldorsson, 2017; Halldorsson et al., 2012, 2014a, 2014b; Thorlindsson and Halldorsson, in press) indicates that organization of youth sport in Iceland is characterized by craftsmanship qualities. Thus, it emphasizes intrinsic motivation, informal play, and the development of skills. Halldorsson et al. (2012) showed that even Icelandic elite athletes are intrinsically motivated and focused on skill training. Halldorsson et al. (2014) showed how informal games allow for honing of skills and provide a good opportunity to foster intrinsic motivation and flow. Skill is vital to all play and sports. All the researchers who discuss craftsmanship see skill as a crucial aspect. Sennett (2008: 20–21, 37–47) points out that craftsmanship is founded on skill developed to a high degree. In short, existing research on sport youth sport in Iceland suggests

that sport participation should be positively related to craftsmanship as stated in hypothesis 2:

Hypothesis 2. There is a positive relationship between sport participation and craftsmanship.

The theory of craftsmanship overlaps with some influential theories on learning and education. Many of the craftsmanship themes appear in abstract form in the work of the pragmatist program of education (Sennett, 2008: 286–291). The theories of John Dewey resemble the craftsmanship approach in their emphasis on an active, student-centered, and task-driven approach to learning and the intimate relationship between problem-solving and problem-finding as well as the intrinsic motivation of play (Dewey, 2001 [1902]). Berger (2003) offers convincing arguments and a lot of real-life examples in support of the craftsmanship approach to classroom teaching. He and other proponents of the craftsmanship approach have criticized standardized tests, fixed curricula, and mechanical teaching, calling for a paradigm change in the modern school system. They want to move away from standardized approaches toward a more flexible system.

The discussion above suggests that the craftsmanship approach is both an effective and a meaningful approach to learning (Berger 2003; Dewey 2001 [1902]; Sennett, 2008). However, the question is, ‘Do students who rely on the craftsmanship approach to learning in the highly institutionalized modern school do better or worse than students who focus on outcomes (standardized tests)?’ It is unlikely that students who rely on the craftsmanship approach would do well in a highly rigid and bureaucratic school system that focuses on outcomes. In that case, we would expect a negative relationship between craftsmanship and school performance. The available research suggests that the modern school system is mixed, including elements of craftsmanship that blend in with more standardized approaches. This mixture of craftsmanship elements with institutional requirements in various degrees results in a considerable variation between institutions and individuals, students and teachers. School policy may discourage or encourage the craftsmanship approach to learning. Teachers may vary in their reliance on craftsmanship in their approach to teaching. Students may differ in their approach to learning. Some of them may rely on active and engaging methods of learning, intrinsic motivation, and holistic understanding, while others may focus more on the outcomes in the form of standardized tests. In other words, the extent to which intrinsic motivation, holistic understanding, and skill-oriented learning are found within the schools may vary considerably across and within levels of analysis. Below we examine how students who rely on craftsmanship approach do in this mixed school system by testing the following hypothesis:

Hypothesis 3. There is a positive relationship between craftsmanship and school performance.

While a positive relationship has been documented between sport and educational performance (Kristjansson et al., 2010; Sigfusdottir et al., 2007; Thorlindsson et al., 1994: 105–128), little effort has been made to search for factors that may explain the relationship between the two. In the discussion above, we suggested that participation in

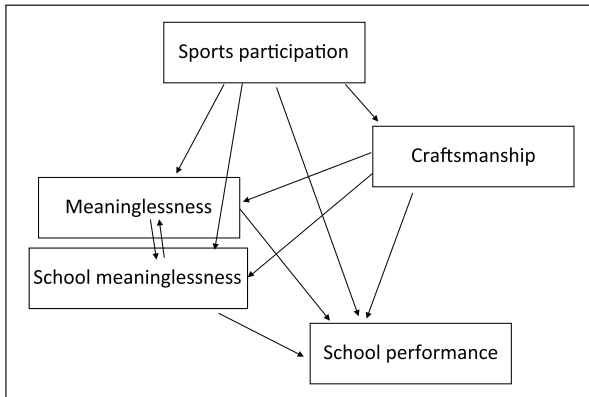


Figure 1. The theoretical model.

sport fostered habits and attitudes of craftsmanship that can be applied to learning tasks in school settings. Craftsmanship may therefore be one of the factors that mediates the positive relationship obtained between sport participation and educational performance:

Hypothesis 4. The relationship between sport participation and school performance is in part mediated by craftsmanship.

The supporters of craftsmanship have argued that it reduces the meaningfulness of schoolwork (see Mills, 1980 [1952]). We therefore hypothesize that meaningfulness should be a mediating factor between craftsmanship and school performance. As mentioned above, we employ two concepts of meaningfulness. We assume that the influence of craftsmanship on school performance may be mediated through both measures of meaningfulness:

Hypothesis 5. The relationship between craftsmanship and school performance is in part mediated by meaningfulness.

The discussion above suggests that five major hypotheses may be combined in a more comprehensive basic theoretical model, which is shown in Figure 1.

We should note that the theoretical model shown in Figure 1 assumes that the two measures of meaningfulness are positively correlated, but we do not specify any kind of causal relationship between them.

Methods

Participants and procedures

The data for this study came from the population-based Youth in Iceland survey. The sample includes all 8th, 9th, and 10th grade students, aged 13–16 years, who were enrolled in Icelandic secondary schools during February 2014. The Icelandic Centre for

Social Research and Analysis (ICSRA) at Reykjavik University conducted the survey. It was carried out with passive parental consent, using procedures approved by the Icelandic authority overseeing the protection of human research subjects. Passive parental consent means that parents have the option to write to the school to request that their children should not take part in the survey. This is something that rarely happens. The ICSRA distributed anonymous questionnaires and envelopes for returning completed questionnaires to all secondary schools in Iceland. Consistent with published study protocols (Sigfusdottir et al., 2009), teachers at individual school sites supervised participation by the students in the study and administered the survey questionnaire. All students who attended school on the day that the questionnaire was administered completed it. Students were instructed not to write their names, social security numbers, or any other identifying information anywhere on the questionnaire. When finished, they were asked to place their completed questionnaire in the sealed envelope provided before returning it to the supervising teacher. A total of 10,783 students or 86.3% of the cohort in 8th, 9th, and 10th grade (50.2% girls) completed the questionnaire.

The Icelandic population is homogeneous (Hagstofan/Statistics of Iceland, 2014), so exogenous variables such as race and religion, which are often used in research in other countries, were not included in the present analysis.

Measurements

The aforementioned work on craftsmanship has been conducted exclusively in the tradition of micro-level sociology using qualitative methods (Becker, 1978; Fine, 1996; Harper, 1987; Mills, 2002 [1951]; Sennett, 2009; Thorlindsson, 1994; Veblen, 1914). Measuring craftsmanship quantitatively required the development of an instrument to measure it. We created such an instrument on the basis of elements proposed by micro-level studies of craftsmanship in different areas (Becker, 1978, 1982; Fine, 1996; Harper, 1987; Mills 2002 [1951]; Sennett, 2009; Thorlindsson, 1994; Veblen, 1914). *The Craftsmanship Scale* consists of eight items measured on a 5-point scale ranging from 'strongly agree' to 'strongly disagree'. The items were as follows: (1) I try to understand how things work; (2) I seek guidance if I don't understand how things work; (3) I try to solve my tasks to the best of my ability; (4) I often focus so hard on tasks that I lose track of time; (5) I enjoy working on tasks; (6) I try to organize my tasks; (7) I see in my mind how I can finish my task; (8) I try to finish the tasks I have started. Variables 1 and 2 represent informal learning and tacit knowledge, 4 and 5 represent intrinsic motivation and flow, 6 and 7 represent holistic understanding, and 3 and 8 represent practice and honing of skills (Cronbach's $\alpha=0.92$).

Academic performance was computed from the following two variables of self-reported grades, in mathematics and Icelandic measured on an 8-point scale ranging from less than 4 to around 10. The computed variable was recoded into low=1, medium=2, and high=3 (Cronbach's $\alpha=0.74$). Several studies that have estimated the accuracy, validity, and reliability of self-reported grades (Karlsson et al., 1993; Kuncel et al., 2005; Maxey and Ormsby, 1971) have found them a fairly accurate measure of actual grades. Thus, Maxey and Ormsby (1971) report a correlation of $r=0.81$ between self-reported grades and actual high-school grades. Karlsson et al. (1993) found

self-reported grades a good predictor of actual grades; they found a slight over-reporting of grades for students with the lowest grades. These studies found that grades for individual subjects tend to be more accurately reported than grade point average (GPA). The research also indicates that self-reported grades generally predict outcomes to a similar degree as actual grades do (Karlsson et al., 1993; Kuncel et al., 2005).

Sport participation was measured on a 6-item scale ranging from 'never taking part in sport in a sports club' to 'doing sport with a sports club almost every day'. The computed variable was recoded as less than 1× a week=1, 1–3× a week=2, and 4× a week or more=3.

Meaninglessness was a computed measure from the six following statements adopted from Dean (1961): 'Most rules can be broken if you feel they don't apply'; 'I follow the rules I choose'; 'There are few absolute rules in life'; 'It's difficult to trust anything because things change'; 'No one really knows what is expected of him/her in life'; 'There are no certainties in life' (Cronbach's alpha=0.82). The computed variable was recoded into high=1, medium=2, and low=3.

Meaningless schoolwork was a computed measure from the two following statements: 'I find my studies meaningless' and 'I want to quit school' (Cronbach's alpha=0.77). The computed variable was recoded into high=1, medium=2, and low=3. The recoding of both the variables measuring meaninglessness divided the respondents into three groups including one-third or 33.33% in each category.

Findings

The main analysis below is based on SEM conducted by AMOS (Arbuckle, 2006). SEM allows us to model both direct and indirect effects using both measured and latent variables. We begin, however, by presenting calculated probabilities for the bivariate relationships that form key theoretical links and provide information about the construct validity of our craftsmanship scale. This is an essential part of our analysis because this is the first time that the craftsmanship scale is used in empirical research. Second, we discuss the measurement model as a first step in the SEM analysis. Finally, we discuss the findings from the structural model.

The construct validity of the craftsmanship scale

Hypothesis 1 states that the craftsmanship approach should correlate negatively with meaninglessness. Figure 2 displays the calculated probabilities for adolescents experiencing high levels of meaninglessness by levels of craftsmanship and controlling for sex.

It indicates that the probability of students in the lowest category of craftsmanship having experienced high levels of general meaninglessness is almost two times higher than that of students in the highest category of craftsmanship. An even stronger pattern of relationship is displayed between craftsmanship and meaningless schoolwork. The probability drops from 0.52 for the lowest category of craftsmanship to 0.17 for the highest craftsmanship level (Figure 3). There are, therefore, moderate and strong negative linear relationships between craftsmanship and both measures of meaninglessness.

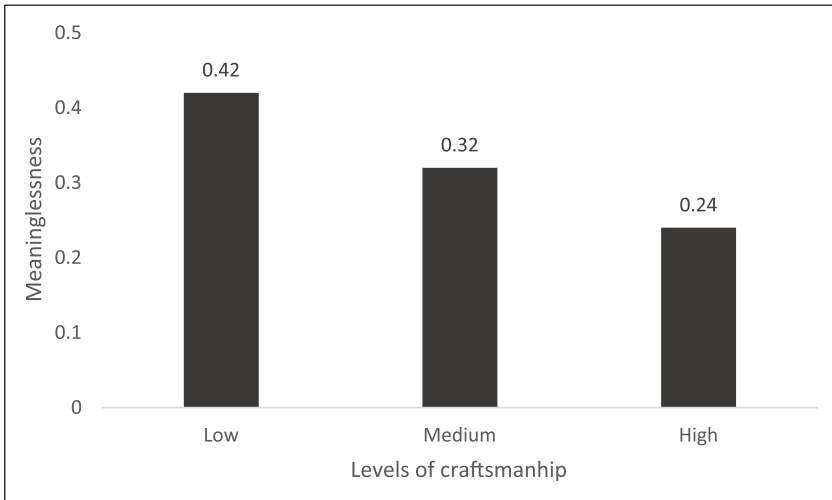


Figure 2. The relationship between craftsmanship and general meaningfulness.

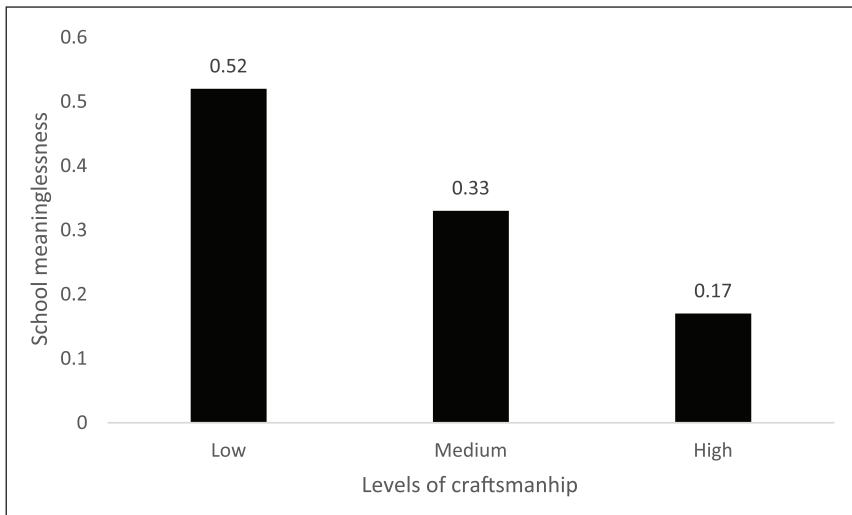


Figure 3. The relationship between craftsmanship and meaningless schoolwork.

Hypothesis 2 states that participation in sport should be positively correlated to craftsmanship. This hypothesis is based on prior research (Halldorsson et al., 2012, 2014a, 2014b) that suggests that the sport environment and the nature of play focusing on skill over outcomes provide a context that resembles the craft workshop in many ways. This is partly confirmed in our data. We asked our subjects, ‘Which is more important in sport: to win or to develop skills?’ More than 90% of them said that developing skills was

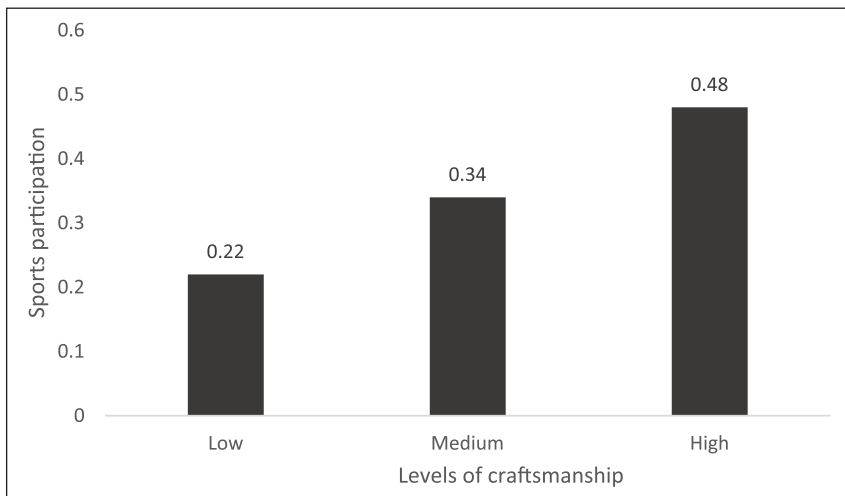


Figure 4. The relationship between craftsmanship and sport participation.

more important than winning. Figure 4 displays the relationship between craftsmanship and sport participation.

The probability that adolescents will cultivate the craftsmanship approach increases from 0.22 for those who do not practice sport to 0.48 for those who engage in sports four times a week or more. As predicted, the results show a moderate positive linear relationship between craftsmanship and sport participation.

Hypothesis 3 states that there should be a positive relationship between of craftsmanship and school performance.

Figure 5 displays the probability that adolescents will be high achievers in school compared with their levels of craftsmanship. It indicates that the probability of students in the lowest category of craftsmanship being high in academic achievement is 0.26. The corresponding figures for the medium and highest categories of craftsmanship are 0.38 and 0.52, indicating that the probability of students being high academic achievers is twice as great among those in the highest category of craftsmanship than among those in the lowest. In short, these findings give substantial and consistent support to the validity of the craftsmanship scale. At the same time, they provide empirical support for the key theoretical links that lay the foundation of the craftsmanship theory.

The measurement model

Our theoretical model involves four key variables that form the latent variables in our analysis. We specified and tested a measurement model involving the four latent variables: craftsmanship, general meaninglessness, meaninglessness of schoolwork, and school achievement. The specification includes the number of factors and a number of indicators for each factor. The specification also states whether the indicators are allowed to correlate or not. Confirmatory factor analysis was used to test the fit of the

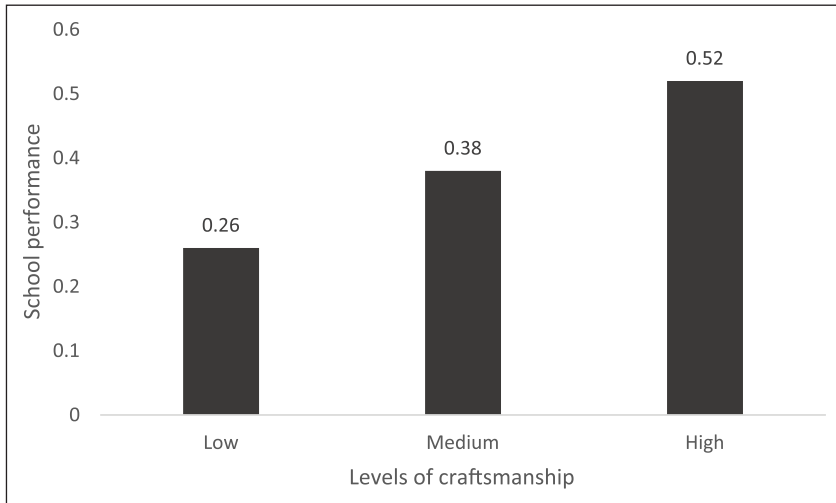


Figure 5. The relationship between craftsmanship and academic achievement.

hypothesized factor structure to the covariate structure of observed variables. We relied, from the beginning, on confirmatory factor analysis to construct all latent variables since the indicators for each latent variable were all already ‘theoretically’ selected. We analyzed a confirmatory model that included the following latent variables: craftsmanship, school performance, meaninglessness, and meaninglessness of schoolwork. Table 1 lists the factor loadings of items on each of the constructs for boys and girls separately.

As can be seen from the table, all the factor loadings are substantial and statistically significant. It should be noted that the factor loadings for the craftsmanship scale range from 0.66 to 0.84 for girls, indicating that all the items load strongly on the scale. The loadings for boys range from 0.70 to 0.85.

The common method in SEM is to perform a chi-square test of the null hypothesis to test whether the observed and the expected matrices are identical. In line with that, models are accepted if the test fails to reject the null hypothesis. However, in large samples, such tests will reject good models on the basis of trivial misspecifications (Gerbing and Anderson, 1992). This is the case in both our models. The chi-square test turns out to be significant because of the large sample size (the whole model includes 10,749 cases). The fit indices for the model are shown in Table 2. Fit indices other than the chi-square test reveal that the model fits the data well. The model has a comparative fit index (CFI) index value of 0.90 and a root mean square error approximation (RMSEA) value of 0.05.

The multivariate analysis

The aim of the multivariate analysis is to describe the structure and the mechanisms involved in the three-way relationship between craftsmanship, sport and school achievement. In Table 3, we present the standardized and unstandardized regression weights from the SEM for boys and girls separately. The table indicates that, as predicted,

Table 1. Standardized factor loadings for the model.

	Boys/girls		
	Craftsmanship	School meaningfulness	Meaninglessness
I try to understand how things work	0.70/0.66		
I seek guidance if I don't understand how things work	0.71/0.68		
I try to solve my tasks to the best of my ability	0.82/0.79		
I often focus so hard on tasks that I lose track of time	0.78/0.74		
I enjoy working on tasks	0.78/0.76		
I try to organize my tasks	0.85/0.84		
I see in my mind how I can finish my task	0.84/0.83		
I try to finish the tasks I start	0.84/0.84	0.74/0.74	
I find my studies meaningless		0.83/0.84	
My studies bore me			0.67/0.68
Following rules does not guarantee success			0.61/0.59
Sometimes you have to break the rules to succeed			0.70/0.66
There are no certainties in life			0.72/0.67
No one really knows what is expected of him or her in life			0.70/0.66
It's difficult to trust anything because things change			0.63/0.61
There are few absolute rules in life			0.66/0.65
I follow the rules I choose			0.69/0.69
Most rules can be broken if you feel they don't apply			
Grades in Icelandic			0.74/0.76
Grades in math			0.80/0.78

Table 2. Fit measures for the model.

Number of distinct sample moments	504
Number of distinct parameters to be estimated	128
Degrees of freedom	376
Chi-square	10,842.918
Confirmatory factor analysis	0.90
RMSEA	0.50

RMSEA: root mean square error approximation.

craftsmanship plays a central role in the model. It influences school performance directly, both for girls ($\beta=0.16$) and for boys ($\beta=0.14$). More importantly, craftsmanship influences school performance indirectly through meaninglessness of schoolwork. In fact, the indirect influences are just as strong as the direct influences for both girls (0.17) and boys (0.14). The relationship between craftsmanship and meaninglessness is significant and moderately strong for both girls ($\beta=0.33$) and boys ($\beta=0.19$). The relationship between general meaninglessness and school performance is also significant, but weak. This means that the indirect effects of craftsmanship on school performance through general meaninglessness are negligible. While both general meaninglessness and school-related meaninglessness are consistently related to craftsmanship, the influence of craftsmanship on school performance is only mediated through school-related meaninglessness. These findings underscore the fact that that meaninglessness exists on different social levels. The contextualization of meaninglessness that is captured in this study by school-related meaninglessness may in some cases be more important than general meaninglessness that is not context-bound.

The theory presented above predicts that the positive relationship between sport participation and school performance, documented in earlier research (Kristjansson et al., 2010; Sigfusdottir et al., 2007; Thorlindsson et al., 1994), was in part mediated through craftsmanship. The findings indicate statistically significant, though weak, support for this hypothesis. They show that the direct effects of sport participation on school performance remain sizable, whereas the indirect effects are statistically significant but relatively weak (0.04 for girls and 0.03 for boys). Our findings, therefore, provide weak support for this element in our model. Also, the association between sport participation and school performance is mediated neither through general meaninglessness nor through school-related meaninglessness. In this context, it should be pointed out that the relationship between sport participation and general meaninglessness is slightly stronger than that between sport participation and school-related meaninglessness. These findings provide weak ($\beta=0.09$ for both girls and boys) but additional support for the contextualization of meaninglessness hypothesis.

Discussion

The aim of this study is to extend the qualitative research on craftsmanship, both substantially and empirically, by conducting a quantitative macro-level analysis based on a nationally representative sample of Icelandic adolescents. To accomplish this task, we developed

Table 3. The confirmatory model.

	Standardized coefficients		Unstandardized coefficients		SE		CR	
	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys
Hypothesized relationships								
Sports participation → Craftsman-ship	0.24**	0.21**	0.06	0.06	0.00	0.00	16.74	14.20
Craftsmanship → Meaninglessness	-0.33**	-0.19**	-0.60	-0.31	0.03	0.03	-20.89	-11.48
Craftsmanship → School Meaninglessness	-0.56**	-0.42**	-1.08	-0.74	0.03	0.03	-31.45	-24.00
Meaninglessness → School performance	-0.06**	-0.70**	-0.08	-0.09	0.02	0.02	-3.51	-4.25
School Meaninglessness → School performance	-0.30**	-0.33**	-0.36	-0.41	0.03	0.03	-13.33	-15.24
Craftsmanship → School performance	0.16**	0.14**	0.37	0.30	0.05	0.04	7.58	7.18
Sports participation → Meaninglessness	-0.09**	-0.09**	0.04	0.04	0.01	0.01	-6.13	-5.98
Sports participation → School performance	0.22**	0.20**	0.12	0.12	0.01	0.01	14.36	12.46
Sports participation → School Meaninglessness	-0.03	-0.06**	-0.01	-0.03	0.01	0.01	-1.77	-4.01

SE: standard error; CR: construct reliability.
 **p < 0.001 (two-tailed).

a scale measuring craftsmanship that consisted of eight items. Our empirical analysis indicates that the scale provided a reliable and a valid measure of craftsmanship. The scale's construct validity was empirically convincing. All the eight items loaded strongly on the craftsmanship scale, and the Cronbach's alpha measurement of reliability was 0.92.

Our findings lend a consistent and a moderately strong support to the craftsmanship theory in several ways. First, the findings support the craftsmanship theory because they show that key elements, which have been attributed to craftsmanship, fit together empirically forming a coherent theoretical construct. It is worth mentioning that the craftsmanship scale, which is introduced in this study, is a general (context-free) measure of craftsmanship that focuses more on the culture of craftsmanship in the abstract than on how it plays out in the social context and the workshop-like characteristics of the social organization involved. The scale measures the attitudes, values, habits, and cultural schemas that are important aspects of the craftsmanship approach. These findings support and complement the many qualitative studies that explain the importance of the culture of craftsmanship in a particular social setting (Becker, 1978, 1982; Berger, 2003; Faulkner and Becker, 2009; Fine, 1996, 2003; Gawande, 2008; Harper, 1987; Mills, 1980 [1952]). These studies vary in their content and in their emphasis on different aspects of the craftsmanship approach, but they all focus on how the culture of craftsmanship plays out in each particular case.

Second, we find that the craftsmanship approach reduces meaninglessness. This is an important finding that lends support to the construct validity of the craftsmanship scale. At the same time, it supports craftsmanship theory, where the notion of meaningless work has been a key idea, restating a long-standing theme in sociological theory that dates all the way back to Marx's theory of alienation (Marx, 1964 [1932]). The theory of craftsmanship, as presented in the original works of the founding fathers, was a critical theory in the tradition of the alienation theses, aimed at academic work that had lost its respect for the craft aspect of scholarship and education. It was especially critical of the 'bureaucratic turn' in education with its emphasis on standardization and business-like input output models that shifted the balance away from the meaningful learning experience of students, tackling relevant and challenging tasks, to an increasingly meaningless schoolwork. Both Becker (1972) and Mills (1980 [1952]) attribute meaninglessness specifically to the organization of schoolwork. Becker (1972) argues that an important source of meaninglessness is that school tasks are isolated from the real-world experiences. Mills (1980 [1952]), on the other hand, argues that meaninglessness is a part of the alienation of work. He sees increased specialization and fragmentation and loss of power as critical elements in the development of alienation. However, much of the literature on craftsmanship, which is either theoretical or qualitative, does not test the important assumption that craftsmanship reduces meaninglessness, employing independent measures of basic concepts. The fact that we employ two separate measures of meaninglessness, which do not overlap with our craftsmanship scale, makes our findings all the more important.

It is informative to look at the interplay of craftsmanship and meaninglessness across contexts. While craftsmanship is negatively related to general meaninglessness, which is not context-bound, the pattern is stronger regarding schoolwork-related meaninglessness. The findings regarding the school environment and meaninglessness suggest that both meaninglessness and the consequences of craftsmanship may to a considerable

extent be context-bound. They may reflect the fact that school is such an important institution for adolescents that it is a major source of meaning. Our findings indicating that the craftsmanship approach reduces meaninglessness need to be interpreted in that light.

It seems almost self-evident that meaningless schoolwork may have important consequences for the welfare of adolescents. It is therefore an important topic in its own right. One serious limitation of our study is that we do not have any direct measures of the mechanism that explains how craftsmanship makes schoolwork more meaningful. Furthermore, there are many other factors, besides the craftsmanship approach, that may influence the meaningfulness of schoolwork. As Berger (2003) has pointed out, meaningfulness of schoolwork depends on the selection of topics as well as the approach to schoolwork. Students who rely on the craftsmanship approach need to have the opportunity to work on meaningful tasks. More research is needed to further our understanding on these important issues.

Third, the hypothesis that craftsmanship plays an important role in school achievement is a central aspect of the craftsmanship theory. Our test of this key theoretical proposition rests on the assumption that the modern school spans a lot of individual variability within schools, and among teachers and students, in terms of skills and attitudes toward learning. We therefore argued that the extent to which individuals rely on the craftsmanship approach to learning is an empirical question. In line with the craftsmanship theory (Mills, 1980 [1952]), craftsmanship-like approaches to teaching (Berger, 2003; Schön, 1983), and sociological research in areas other than schoolwork (Becker, 1978, 1982; Fine, 1996; Harper 1987; Mills, 2002 [1951]; Sennett, 2008; Thorlindsson, 1994), we hypothesized that the methods of the general craftsman will influence school performance in a positive way. This hypothesis is supported by the present findings. They show a moderately strong positive relationship between craftsmanship and school performance. We also find that the positive relationship between craftsmanship and school performance is mediated by meaninglessness. These findings support scholars such as C. Wright Mills (1980 [1952]), who argued that craftsmanship may enhance school performance because it reduces meaninglessness.

Fourth, following prior research (Halldorsson et al., 2012, 2014a, 2014b), we argued that because the organization of youth sport in Iceland is characterized by craftsmanship, sport participation should correlate positively with school performance. This notion is confirmed by our findings. The findings also show that the influence of sport participation on school performance is in part mediated by craftsmanship. The direct influences of sport participation on school performance remain, however, sizable.

These findings are in line with prior research on school performance that stress the importance of play, intrinsic motivation, and the development of skill in school performance (Halldorsson, 2017; Halldorsson et al., 2012, 2014a, 2014b; Ryan and Deci 2000). All these elements are part of the craftsmanship approach, which may influence schoolwork. The relationship is complicated, however, because the craftsmanship approach cannot always be directly transferred from one social context to another. There may be a number of school characteristics that influence the process of transmission of craftsmanship from sports to school. One reason for this may be that the social organization of the school context varies from institution to institution, class to class, and even from teacher to teacher. Some institutions may not be open to task-oriented active learning. They may

rely more on standardization and formal bureaucratic approaches to schoolwork. Students who have come to rely on craftsmanship in sport may have few opportunities to apply and develop that approach in their school. The organization of schoolwork may thus hinder or enhance craftsmanship.

As we have discussed above, the theory of craftsmanship in education has for decades been a critical theory, while in many other contexts it has been a theory of excellence (Becker, 1978, 1982; Fine, 1996, 2003; Gawande, 2008; Harper, 1987). It is only recently that the craftsmanship theory has been presented as a theory of excellence in education (Berger, 2003). Recent changes in classroom and teaching technology may change the balance to a more student-centered, active, and task-oriented learning. These changes may highlight important elements of craftsmanship approach in a new educational context.

In conclusion, we should highlight the fact that methods do not represent a ‘neutral’ way of collecting and analyzing data. Every method has its own characteristics, its own style of drawing inferences, highlighting theoretical issues, identifying critical limitations, and evaluating strengths and weaknesses. One major strength of the case study approach is, as we have discussed above, that it shows that context is important and place matters. This qualitative research highlights one of the limitations of this study and other quantitative inquiries along these lines, which is that it is weak on the mechanisms that characterize the contextualization of the craftsmanship culture. Future quantitative research on craftsmanship needs to develop direct measures of the craftsmanship-like qualities of the social context. These contextual characteristics could then be analyzed by multilevel statistical techniques to improve our understanding of the interplay of individual and contextual factors.

Our quantitative analysis draws attention to the weakness of the qualitative research when it comes to comparing craftsmanship across contexts and to develop the general aspects of the theory further. Also, the analysis that relies on well-defined ‘stand-alone’ concepts that can be measured independently of each other draws attention to existing ambiguities that arise when one moves from qualitative to quantitative mode of doing research. The development of the craftsmanship scale offers opportunities to compare the craftsmanship approach across social contexts and develop more general aspects of the craftsmanship theory. Thus, the qualitative and the quantitative approaches complement and push each other to set the agenda for future research.

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Author biographies

Thorolfur Thorlindsson is Professor in Sociology at the University of Iceland. He has published widely in various areas of sociology. His current research focuses on the multilevel nature of social structure and the role of emergence in individual and group behavior with emphasis on the role of community and neighbourhoods in the welfare of adolescents.

Vidar Halldorsson is an Associate Professor in Sociology at the University of Iceland. He has carried out research on the social environment and the social context of youth and elite sports. His current research interests include; sport culture, sport achievement and social networks.

Inga Dora Sigfusdottir is a Professor at Reykjavik University in Iceland, a Research Professor at Teachers College, Columbia University, New York and a visiting Professor at Karolinska Institutet in Stockholm. Most of her scientific work can be described as sociological research on youth and adolescents and their health and well-being. In conjunction with her research activities, she has provided academic leadership as both the founder and CEO of a social science research institute, the Icelandic Centre for Social Research and Analysis (ICSRA) and as the Founding Dean of the School of Health and Education, Reykjavik University.

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