Playing and learning:

A study of the link between playfulness and motivation to learn in higher education

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Masters of Science in E-learning
University of Edinburgh 2009

Abstract

The present study investigates the existence of a theoretical link between individuals' general level of playfulness and their “academic playfulness”, that is their learning motivational orientation in higher education. A non-experimental fixed design was followed which involved an online questionnaire adapted from previous instruments as well as online semi-structured interviews in order to quantify that link and to try to identify mechanisms helping to explain it. Seventy undergraduate and Master's level students enrolled in one British and several French universities answered the questionnaire and 5 students were interviewed. A small correlation between playfulness and intrinsic motivation to learn was found. This correlation was stronger for males and learners enrolled in more qualitative courses, even though the latter result is not statistically significant. Evidence suggests that playfulness is not related to either gender or age and that intrinsic and extrinsic motivation could be best understood as two separate but related constructs. Likely mechanisms playing a role in the influence of playfulness on intrinsic motivation to learn include the need for social relationships, creativity, active engagement and achievement. Evidence suggests that playfulness influences people's studies and occupations and that the reverse effect sometimes also occurs. As a result, educators should consider encouraging playful approaches to learning for highly playful students because this can be seen as potentially supportive to their intrinsic motivation. This suggestion could be particularly relevant for male learners and students enrolled in qualitative courses, even though more research is needed to support this results.

Acknowledgements

I would like to send my thanks to:

- My supervisor, Dr Hamish Macleod, for his excellent guidance, knowledge, availability and support during this project and, more generally, during this year of study.

- The translators and testers who helped me refine the instruments used in this study.

- The participants who kindly accepted to complete the online questionnaire or to take part in online interviews and without whom this study would not have been possible.

- My family, friends and especially, “Kiki” as well as my girlfriend Isabelle, for their encouragements during my studies and their presence in my life.

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1. Introduction

Adults often view playing and studying or working as two distinct activities. This conceptual opposition is strengthened by the way people organise these activities in terms of time and space: for instance, many young adults work from 9am to 5pm in their office before they meet with people with whom they share a specific personal interest in a distinct location later in the day or during weekends.

Yet, based on Vygotsky's work, Barab et al remind us that playing and learning are all one during our childhood:

> “Learning is one of the most natural acts in which a child can engage. Developmentally, young children are born with a propensity to decipher the world around them, make sense of sights and sounds, and learn complex language skills (Vygotsky, 1978). As children progress to more formal skills, such as recognizing letters and reading, they typically do not view learning these arbitrary symbols as work, but rather approach it as play. In elementary school, a different attitude towards learning regularly emerges; school-based learning is often something that must be done before a child is allowed to go out and play - an activity distinct from play and explicitly labelled 'work'” (2005, p. 15).

This differentiation between playing and learning is accompanied by a distinction between intrinsic and extrinsic motivation: it is very common for adults to be much more motivated by their pastimes than their studies or work.

Observing this discrepancy, some educators and parents regularly blame leisure activities such as television, internet or video games for distracting students from the business of academic learning. But recently, researchers have begun to look at these media, especially video games, in a different way and have consequently tried to harness their motivating power for educational purposes. For instance, Kurt Squire has experimented with the use of a commercial video game to support History learning at school (2005). Importantly, Gee has investigated successful video games and discovered 36 good learning principles which need not only apply to video games but can greatly enhance traditional course designs as well (2003).

With regards to these attempts to reconcile playing and learning, it appears that people have “their own way of learning, ‘a learning style’” (UK Center for Legal Education 2008). At a broad and basic level, such preferences might be understood in terms of the technological

divide between “digital natives” and “digital immigrants” (Prensky 2001), referring to the difference between people who grow up with technology and those who try to learn how to it later in life. Another important learning preference can be understood as the distinction between the traditional approach to course design on the one hand where teachers aim to transmit a broad knowledge base and the personal-relevance approach to course design on the other where learners are more involved in the design of the curriculum such that they may explore topic of personal interest (Toohey 1999). The latter, thanks to the deep involvement and the exploratory, “playful” behaviours it promotes, lead to increased learning (e.g. Miller 1973 cited in Webster and Martocchio 1992, p. 207).

Therefore, it becomes interesting to evaluate how students' personality relates to the distinction between traditional and playful approaches to teaching and learning. In particular, how does general playfulness relates to behaviours characteristic of what might be called “academic playfulness” in higher education?

To my knowledge, there has been very little research about that hypothetical link and none of them seems to have taken an exploratory qualitative angle into the mechanisms that could help understand it.

As a result, the present study aims to assess whether there is a link between a student's general level of playfulness and their level of “academic playfulness” in higher education: in fact, that notion was later reconceptualised into learning motivational orientation. Provided such a link exists, it will also attempt to identify a few mechanisms that can help explain it. To explore the suggested theory, a non-experimental fixed design was followed that mainly involved a student survey as well as 5 interviews of individuals selected from the same population. Volunteers were informed that there answers would remain confidential and that findings would be reported anonymously. Due to the small scale of the study and the limited resources available, there a few limitations to its findings in terms of validity and generalizability that must be taken into account.

2. Review of the literature

Due to the relatively recent interest in studies about play and learning, this literature review ranges broadly across the four foci which are part of Cooper's Taxonomy of Literature Reviews (1988 cited in Randolph 2009, pp. 2-4): guided by the aforementioned research questions, it was as much focused on findings and theories about playfulness and its component parts as it was on methods to measure it in the appropriate contexts.
Its goal was to critically evaluate the literature to justify the usefulness of the study. Most importantly, it also aimed to help revise the research questions by operationalizing “general playfulness” and “academic playfulness” and learn about any existing instruments that could have been re-used or adapted to measure them. It also aimed to identify intervening variables in the possible link that is considered so as to explore them in further details.

Given the time available, the literature was covered by adopting a purposive sampling approach in which central articles were selected based on their match with the research questions and their influence in the field. The selection of articles about computer playfulness as well as subsequent references that were suggested by my supervisor helped expand the search: in particular, the references section within each article was very valuable in assessing the value of other key materials and deciding whether to include them in the review. Based on this data, the two playfulness constructs that are part of the research questions were refined and operationalized.

Finally, the review is organised around a conceptual scheme, starting from generalities about play, games and learning, followed by general considerations about playfulness, “applied” playfulness and, eventually, social desirability issues.

2.1. Play, games and learning

In our everyday conceptions, we regard play as being something associated with children while adults are believed to be primarily concerned with work and “serious” endeavours. As such, we generally oppose these two notions and tend to believe that they are parasitic upon one another. However, we all feel that certain types of occupations do not fit very well in the “work” category: that seems to be the case when we consider professional sports or artistic jobs such as musician, etc.

Many researchers have questioned that apparent dichotomy as well. For instance, Kane (2005, p. 44) makes mention of Sutton-Smith's observation, also cited Marano (1999), that the opposite of play isn't work but depression. Carroll and Mack's argue that "the capacity to treat work as play characterizes successful adult learners and problem solvers" (1984 cited in Webster and Martocchio 1992, p. 201). Similarly, Glynn and Webster indicate that "serious" activities such as work might be accomplished very playfully at times (1992, p. 83).

It appears that, far from being polar opposites, play and work can sometimes overlap.

We all play and therefore, we all know what play feels like, yet it is very difficult to define what it exactly is.

Aware of the "ambiguity of play", Sutton-Smith lists a number of playful activities and experiences under several headings: mind or subjective play; solitary play; playful behaviours; informal social play; vicarious audience play; performance play; celebrations and festivals; contests (games and sports); risky or deep play (1997, pp. 4-5). In the following pages, "play" or "playful" generally refers to activities and experiences as varied as those mentioned by this theorist.

Discussing videogames and outlining the challenge of defining concepts as elusive as play and games, Newman starts by defining them using the negative form: a video game is not simply a bunch of cool features, fancy graphics or challenging puzzles (Rollings and Morris 2000 cited in Newmann 2004, pp. 15-16). Next, he considers past research in an attempt to distinguish play from game: Huizinga believes that play is free whereas a game is constrained by a set of rules (1950 cited in Newman 2004, pp. 18-22). Likewise, Caillois proposes that "ludus" can have complex rules whereas "paidea" is not or little regulated (2001). Vidart, in agreement with Vygotsky (1933 cited in Casas 2003, p. 10), objects that apparently free play does in fact have complex rules: as part of any playful actions, some behaviours and actions are accepted and others are not even though the underlying rules often remain implicit (1995 cited in Newman 2004). Following Frasca's modification of Caillois' terminology, one may consider play to be different than a game, in that play has no immediate objective other than the player's pleasure (1999 cited in Newman 2004, pp. 19-20). Considering the variety of play and games, Caillois further distinguishes them based on their primary characteritic (2001, p. 36): competition (agôn); chance (alea); simulation (mimicry); and vertigo (ilinx).

2.1.1. Learning and playing as becoming

If, as Newman contends, play's “only reason to be is based on the pleasure experienced by the player” (2004, pp. 19-20), the lay person may better understand the term as “hobby” or “pastime”: indeed, Sutton-Smith notes that “almost anything can allow play to occur within its boundaries” (1997, p. 3).

Supporting this view, a number of theories associate play and learning, especially with regards to the simulation category (mimicry) presented above.

Gee's seminal book which relates videogame play and learning (2003) is of particular interest here: he observes that whereas school often fails to have students involved in its activities, other pastimes such as videogames often have the reverse effect. He also notes that one of the characteristics of successful videogames is that they are very challenging: in order to succeed, players therefore need to learn a lot about the domain of the game to move through the levels, from beginner to expert player. From these initial observations, he studied successful videogames to discover 36 learning principles and shows how schools would benefit from implementing them in traditional curricula: far from being opposite constructs, play and learning appear very close, including in adulthood. One of the core mechanisms that make people learn is illustrated by the Identity Principle (pp. 54-66). The author shows that learning (including in most games) happens through a tripartite play of identities:

- the player's real-world identity: **the player** as the character
- the player's virtual identity: the player as **the character**
- the player's projective identity: the player **as** the character

The real-world identity represents the player's core identity (itself composed of multiple identities) in the real world. Their virtual identity is their representation in the game and is illustrated by their character's actions. Eventually, their projective identity is the interaction between their real-world identity and their virtual identity: it represents the player's values, beliefs and desires for their character. It might be thought of as their ideal character in the game, i.e. what they want their character to be. The existence of that identity often becomes manifest, for example, when “players redo a given fight scene because they feel they have 'let their character down'” (p. 58).

Likewise, Lave and Wenger's concept of “legitimate peripheral participation” explains how a person is gradually enculturated in the “ways of thinking and practising” of a given discipline or community of practice (1991).

These ideas show the existence of a very close link between playing and learning: in effect, Kane argues that "the core function of play and simulation [...] is to give us higher mammals a chance to exert our virtual mastery over a skill or scenario" (2005 p. 64).

Using the categories of play described above, learning may be ideally viewed as a mimicry paidea, that is, an endless process primarily based on simulation (even though extrinsically motivated learners may regard it as a mimicry ludus which goal is to reach a given grade and other assessors' expectations): for instance, the science classroom is simply a simulation of the natural science community where students play at being scientists and gradually become so thanks to the projective identity described by Gee (2003).

As he reminds us:

> “People cannot learn in a deep way within a semiotic domain if they are not willing to commit themselves fully to the learning in terms of time, effort, and active engagement” (2003, p. 59).

But active engagement at school, which is central to the view of “learning as becoming”, can take multiple forms depending on the student's level, their motivation to learn and the freedom they are given: some learners are more curious, self-regulated and take a more active role in their education than others, so personal characteristics may play a central part in the process.

The present research focuses on these dispositional differences and investigates the possible association between a student's general playfulness and their academic playfulness in the context of higher education.

As Sutton-Smith points out, studies about play reflect the diversity of play forms: they depend on the discipline of interest (1997, p. 6). A further difficulty is that the literature of adult play is less plentiful than that of children (Glynn and Webster 1992, p. 83), probably because of the reasons that were discussed above.

2.2. General playfulness

2.2.1 Trait and state

From a grammatical point of view, playfulness represents a disposition to be playful, that is, "a behavioural tendency to act in a playful way as opposed to another" (Casas 2003, p. 24).

Lieberman, a pioneer researcher in the field, throws light on the common child-play vs adult-work misconception: she states that while play may be extinguished as the child matures, playfulness survives in adulthood and "has major implications for childrearing practices, educational planning, career choices and leisure pursuits." (Casas 2003, p. 11). This assertion very strongly supports the link that is investigated here.

Tan and McWilliam regard playfulness as "a learning disposition that mobilises productive engagement with new learning innovations" (2008, p. 1). To measure it, they consider factors such as learning and performance goals (e.g. Bruning et al 1999, p. 139), cognitive playfulness and personal innovativeness. Cognitive playfulness is defined as "the learner's dexterity and agility in terms of intellectual curiosity and imagination/creativity" (Tan and McWilliam 2008, p. 2) and "one's willingness to change, an openness to new experiences and the propensity to go out of one's way to experience different and novel stimuli particularly of the meaningful sort" (p. 3). They show that, unlike performance-oriented learners, intrinsically motivated students are likely to experiment with innovative learning tools (p. 6), which may then lead to increased learning. Therefore, cognitive playfulness is an important component of "academic playfulness".

Kane states that "play is an attitude before it is anything else" (2005, p. 48).

At this point, it is important to distinguish the "trait" of playfulness as "a motivational characteristic of individuals" from the "state" of playfulness as "a subjective characteristic of an experience" (Glynn and Webster 1992, p. 85; Webster and Martocchio 1992, p. 203). In other words, a trait is a general characteristic that is part of an individual's personality and is relatively stable over time and across situations. On the other hand, a state is a cognitive and affective episode that is experienced in the short run and fluctuates over time and across situations (p. 203). To complicate matters, the authors report that more and more studies are interested in situation-specific traits which "are more likely to operate in specific situations

than in all situations” (Day and Silverman 1989 cited in Webster and Martocchio 1992, pp. 203-204).

Finally, considering the definition of playfulness adopted by Casas (2003) and by Tan and McWilliam (2008), a disposition may be viewed as a behavioural consequence of an individual's trait.

It becomes possible to say that the present study is concerned with the possible link between a student's general trait of playfulness and their situation-specific trait of playfulness when learning, specifically in higher education.

2.2.2. Toward a definition of general playfulness

Glynn and Webster explain that playfulness at work can alleviate boredom, release tension, prevent aggression and symbolise workgroup membership and solidarity. It often results in learning, adaptation, creativity, community building, greater attention to quality and better performance overall (1992, p. 84). Clearly, these findings indicate that the situation-specific trait of playfulness in the workplace is a major asset.

Dewey describes playfulness as “the capacity to draw satisfaction from the immediate intellectual development of a topic, irrespective of any ulterior motive” (1913 cited in Webster and Martocchio 1992, p. 204). This explicit association between playfulness and intrinsic motivation is very consistently underscored in the literature. For example, Barnett argues that “Individuals with playful dispositions are said to be guided by internal motivation, an orientation toward process with self-imposed goals, a tendency to attribute their own meanings to objects or behaviors (that is, to not be dominated by a stimulus), a focus on pretense and nonliterality, a freedom from externally imposed rules, and active involvement” (1991, cited in Webster and Martocchio 1992). This general definition, in agreement with that given by Rubin and colleagues (1983 cited in Casas 2003, p. 2) is relevant to both forms of playfulness of interest in the present research.

Lieberman specifically designed a Playfulness Scale for use with children that consists of 2 items for each of the following playfulness factors: physical spontaneity; social spontaneity;

cognitive spontaneity; manifest joy; and sense of humour (1977 cited in Barnett 1984, p. 156).

Starbuck and Webster describe playfulness as a predisposition to extract immediate pleasure from and and become involved in activities (1991 cited in Glynn and Webster 1992). This is consistent with Csikszentmihalyi who states that “playful interactions are enjoyable, engaging, and not dependent on external needs” (1975 cited in Glynn and Webster 1992).

Further, Glynn and Webster show that playfulness can be measured: they conceptualize it as:

> “an individual trait, a propensity to define (or redefine) an activity in an imaginative, nonserious or metaphoric manner so as to enhance intrinsic enjoyment, involvement, and satisfaction. Playfulness is a multidimensional construct, encompassing cognitive, affective, and behavioural components, which together constitute a continuum along which individuals range from low to high” (1992, p. 85).

Indeed, Sandelands and Buckner contend that self-reports are the most appropriate methods for measuring this construct (1989 cited in Webster and Martocchio, p. 217).

Glynn and Webster developed the Adult Playfulness Scale, a theory-based measure of adult's playfulness suitable for the workplace, incorporating the factors of spontaneity, expressiveness, fun, creativity and silliness, which shows good reliabilities and validities (1992). In their study involving over 300 participants, playful individuals scored high on cognitive spontaneity (supporting that factor of playfulness) and creativity. Playfulness was inversely related to organizational rank and quantitative functional orientation (for instance, economics and finance are deemed more quantitative than liberal arts and management). More playful individuals also showed higher task evaluations, involvement, and performance, as well as more playful perceptions (p. 98).

Taken as is, their instrument is not fully suitable here because it was tested on participants having considerable work experience, which does not necessarily match the scope of the present study. Most importantly, it was designed based on the opposition between play and work, which is refuted by several theoreticians and empiricists (Barnett 2007, p. 950) and goes against the theoretical stance adopted here. Eventually, Kruger reports problems with the content and construct validity of the instrument (1995 cited in Barnett 2007, p. 950)

Nonetheless, further work on the scale (Glynn and Webster 1993) showed interesting results with regards to this study: the authors extended the nomological network (Cronbach and Meehl 1995 cited in Trochim 2006) of their 1992 Adult Playfulness Scale by providing

further evidence of its concurrent validity: they studied a sample of highly intelligent adults to relate playfulness with innovative attitudes, intrinsic motivational orientation and personal orderliness, which was defined by trait adjectives such as disciplined, scheduled, planful, unvarying and deliberate (Jackson 1984 cited in Glynn and Webster, p.1024). They also measured participants on social desirability, the tendency of individuals to present themselves in a favourable light (Crowne and Marlowe 1960, p. 350). As expected by the researchers, playfulness was found to correlate negatively with personal orderliness and positively with both innovative attitudes and intrinsic motivational orientation (Glynn and Webster 1993, p. 1025).

That result, although focused on the workplace, is directly relevant to the present study since it appears to support the link between general playfulness and academic playfulness: in effect, the latter is very closely tied to the concept of intrinsic motivational orientation.

The proposed study will extend existing research by assessing that link and its underlying mechanisms in the specific context of higher education.

Noting some of the limitations of the Adult Playfulness Scale (Glynn and Webster 1992, 1993), Barnett attempted to define and provide a way to measure playfulness in young adults (2007). She asked six hundred and forty-nine university students from social and behavioural science classes what they felt characterized playful individuals. These were also asked about both playful and non-playful people whom they knew. Participants then rated themselves as well as people they regarded as playful and non-playful on the resulting list of 42 descriptors. Following a series of analysis, only 15 of these descriptors were retained and grouped into four factors: Gregarious (cheerful, happy, friendly, outgoing, sociable); Uninhibited (spontaneous, impulsive, unpredictable, adventurous); Comedic (clowns around, jokes/teases, funny, humorous); and Dynamic (active, energetic). Contrary to previous findings (e.g. Glynn and Webster 1992, p. 92), creativity was not found to be a meaningful part of the construct.

Consequently, the author defines playfulness as:

“the predisposition to frame (or reframe) a situation in such a way as to provide oneself (and possibly others) with amusement, humor, and/or entertainment. Individuals who have such a heightened predisposition are typically funny, humorous, spontaneous, unpredictable, impulsive, active, energetic, adventurous, sociable, outgoing, cheerful, and happy, and are likely to manifest playful behaviour by joking, teasing, clowning, and acting silly.” (p. 955).

Barnett states that her study “presents a cogent way in which to define and measure playfulness in young adults, thereby serving as an important starting point for future research”. Despite the fact her instrument does not appear to have been widely used and tested as of yet, it does seem to fit the needs of the present study and was therefore chosen for measuring the “general playfulness” construct. Interestingly, the Uninhibited and Dynamic scales and, more specifically, the Adventurous and Active adjectives can help assess whether people who seek new challenges are more playful in an academic context than those who do not.

Studying children’s play, Rubin and colleagues found six aspects of play dispositions that are also relevant to adults: an intrinsically motivated behaviour; a focus on the process over the product; play rather than exploratory behaviours; nonliterality; freedom from external rules; and active engagement (1983 cited in Casas 2003, p. 2). The Child Behaviours Inventory, created based on these six criteria (Moore 1985; Rogers et al 1988, 1998 cited in Casas 2003, pp. 19-20) was shown to be both reliable and valid and has been used in various studies on children playfulness. Following the same dispositional criteria of play, Graham adapted the Child Behaviours Inventory to create an adult version called the Adult Behaviours Inventory (1987 cited in Casas 2003).

A study of older adolescents college students used both the Adult Playfulness Scale (Glynn and Webster 1992, 1993) and the Adult Behaviours Inventory (Rogers et al 2000): both instruments measure a disposition called playfulness but two criteria from the Adult Playfulness Scale, “fun” and “silly”, correlated the least with results from the Adult Behaviours Inventory (Casas 2003, p. 24). Playfulness correlated significantly with the temperament aspects of persistence, low distractability, flexibility, positive mood and approachability (p. 24). Using the tool with university students and teachers, Graham found that only the former scored higher on divergent thinking and creativity if they had higher scores on playfulness and elaborate responses (1987 cited in Cases 2003, p. 26), thereby supplementing past literature which has proven ambiguous about that aspect (Barnett 2007, p. 956; Glynn and Webster 1992, p. 92).

Despite the Adult Behaviours Inventory having been shown valid and reliable as a means of measuring playfulness in older adolescents and young adults (Rogers et al 2000 cited in Casas 2003, p. 37), it uses a different definition of the construct to that of Barnett's (2007). The latter was preferred in the present study because it is more suitable to the view of playfulness as a personality trait (Glynn and Webster 1992, p. 85; Webster and Martocchio

1992, p. 20) and because it makes it possible to divide the construct into its factors, thereby making it easier to answer the research questions.

2.2.3. Operational definition of general playfulness

> “Playfulness is the predisposition to frame (or reframe) a situation in such a way as to provide oneself (and possibly others) with amusement, humor, and/or entertainment. Individuals who have such a heightened predisposition are typically funny, humorous, spontaneous, unpredictable, impulsive, active, energetic, adventurous, sociable, outgoing, cheerful, and happy, and are likely to manifest playful behaviour by joking, teasing, clowning, and acting silly.” (Barnett 2007)

Participants are asked to rate themselves on each of these 15 descriptors, utilizing a 10-point scale ranging from ‘‘very little’’ to ‘‘a lot’’.

The person's general level of playfulness is the sum of their scores on each of the 15 descriptors adapted from Barnett (2007).

2.3. Microcomputer playfulness

A significant body of literature has focused on the role of playfulness in relation to microcomputers. Therefore, this is an interesting area to learn about what one might call “applied playfulness” or the situation-specific trait of playfulness: it will help inform the idea of “academic playfulness” which is of specific interest in this study.

2.3.1. Studies of microcomputer playfulness

Webster and Martocchio were the first to develop and provide an initial assessment of the validity of “an individual measure of playfulness corresponding specifically to microcomputers” (1992, p. 2003). They describe microcomputer playfulness as a situation-specific motivational individual characteristic and a type of intellectual or cognitive playfulness: “It describes an individual's tendency to interact spontaneously, inventively, and imaginatively with microcomputers” (p. 202).

As previously mentioned, research suggests that long-term outcomes such as learning result from playfulness:

> “those who are higher in playfulness will interact more playfully with activities such that they will exercise and develop skills through exploratory behaviors, resulting in enhanced task performance.” (Miller 1973 cited in Webster and Martocchio 1992, p. 207).

On the other hand, it would appear that it sometimes lead to over-involvement, which can be understood in terms of Csikszentmihalyi's theory of “flow”: that notion refers to a form of transe (Norman 1993, p. 31), a state of complete absoption and focused concentration in an activity such that people often lose the sense of awareness and time. Webster and Martocchio explain that because of that, playfulness can result in wasted time (1992, p. 202). Nevertheless, this concern is arguably less relevant in higher education as there is much to be said about the learning benefits resulting from serendipity on such occasions (e.g. Deci and Ryan 1985 cited in Pauli et al 2003, p. 412). In effect, Gritton believes that serendipitous learning often precipitates exploratory and informal learning, which learning goals tend to be more personal than in objective-driven approaches. As a result, knowledge retention tends to be high, because learning is guided by intrinsic motivation (2007). Bahrick et al underline the link between intrinsic motivation and the quality of incidental learning (1952 cited in Amabile et al 1994, p. 951).

Of the five factors of playfulness identified by Lieberman (1977 cited in Barnett 1984, p. 156), Webster and Martocchio highlight cognitive spontaneity as the most relevant one in the context of human-computer interactions (1992, p. 204). They report Lieberman stating that

> “overt manifestations of cognitive spontaneity are curiosity and inventiveness... [the student] will be testing hypotheses in the the proportional 'if-then' manner, will go over his thinking, and the reservoir of factual knowledge through the process of reversibility of operations, and may come out with unique solutions as a result of his 'playing with ideas'” (p. 204).

After reviewing the literature on general playfulness, the authors created a self-rating scale for adults: it is based on Lieberman's cognitive spontaneity construct but was made situation-specific to microcomputers. The scale was then refined as a result of the ensuing pre-test and pilot stages. Five studies involving over 400 participants revealed that it showed good validity and reliability and that the seven adjectives of cognitive spontaneity they identified, namely spontaneous; unimaginative (r); flexible; creative; playful; unoriginal (r); and

uninventive (r) (Webster and Martocchio 1992 cited in Pauli et al 2003, p. 414) could be grouped into four factors. The researchers found that computer playfulness is positively related to computer attitudes, computer competence, computer efficacy, involvement, positive mood, satisfaction, learning and inversely related with computer anxiety. (1992, pp. 216-217).

Like most studies on general playfulness, they found no relationship between computer playfulness and either gender or age. Importantly, they found that playfulness “may represent a more efficient predictor of involvement, positive mood, satisfaction, and learning than either computer attitudes or anxiety”.

Potosky explored the relationship between computer playfulness, computer knowledge and experience, performance during training, and post-training self-efficacy on 56 newly hired computer programmers (2002). Each participants was measured on these constructs before and after they took part in a SQL-Oracle training program. Specifically, computer playfulness was measured using Webster and Martocchio's instrument (1992). Results show that it was the more playful individuals, those with a tendency to explore how a program works and who also performed well during training who had higher efficacy judgements, that is, who were more confident in their post-training programming capabilities (Potosky 2002, p. 253). Diamond explains that this is because exploration reduces uncertainty in novel situations, which is why it is central to learning (1996 cited in Price et al 2003, p. 270). That is an interesting finding: according to Bandura, “self-efficacy is a judgement of one's ability to perform a task within a specific domain” (1997 cited in Bruning et al 1999, p. 112). Self-efficacy is positively associated with task engagement, strategy use, persistence, resistance to negative feedback, help seeking and performance (Pajares 1996 cited in Bruning et al 1999, pp. 113-114). Given the exploratory behaviours it promotes, high self-efficacy is related to perceived control of one's environment (Bandura and Wood 1989 cited in Bruning et al 1999, p. 114). Taken together, these results indicate that, in a given domain, more playful individuals who perform well have higher self-efficacy which, in turn, positively influences future learning in that domain. Further, the notion of self-efficacy applies to successful task engagement and performance in any domain (Bruning et al 1999, p. 113) and, despite being domain-specific at the level of the individual, it may sometimes generalize from one domain to another (e.g. Shell et al 1995 cited in Bruning et al 1999, p. 113): for instance, a student whose self-efficacy in Mathematics increases thanks to their hard work and who shows

internal attributional responses (Bruning et al 1999, pp. 121-122) may, some time later, exhibit an increase in their self-efficacy in another related discipline, such as Physics.

Not synonymous with self-efficacy but related to it, Barab et al found that achievement was a key motivational element in the educational game they created for children (2005, p. 20).

For these reasons, self-efficacy and achievement seem to represent prominent mechanism in the possible effect of general playfulness on academic playfulness. The present study will provide additional data that will help inform the generalizability of self-efficacy.

2.3.2. Experiential learning

The similarities between general playfulness and computer playfulness that appear here support the legitimacy of the present study and just like cognitive spontaneity is utmost in the study of computer playfulness, it is equally central to the construct of academic playfulness. For example, in an assignment given as part of a course following an experiential/personal-relevance approach (Toohey 1999, pp. 59-63), a student may choose a topic of personal interest as an opportunity to explore unfamiliar content, possibly related to a theory they may held. In so doing, they may start by reviewing the literature to learn more about that subject-matter and subsequently see their initial theory supported, altered or enriched. In a nutshell, and in agreement with Gee's Probing Principle (2003, pp. 90-96), just like people can play with microcomputers, students can play with ideas while enrolled on a formal academic course.

Price and colleagues investigated children's interactions with tangibles, that is, physical devices that are electronically augmented to trigger various digital events in order to find out innovative ways of learning (2003). These interactions have the potential to bring playfulness back into learning, from which it began to be compartmentalized in primary school (Barab et al 2005, p. 15). They designed an adventure game where pairs of children have to discover as much as they can about a virtual creature called the Snark, by collaboratively experimenting with a suite of tangibles. The authors argue that in addition to fun, playful learning should encompass the following 5 inter-related activities: exploration through interaction; engagement; reflection; imagination, creativity and thinking at different levels of abstraction; and collaboration (Price et al 2003, p. 170): these elements together

with their visible manifestations (pp. 178-182) clearly point to the process of experiential learning (Kolb 1993).

As part of a similar design-based project aimed at teaching more “academic” content, Barab and colleagues created Quest Atlantis (2005), which helped them to a new theoretical framework called Learning Engagement Theory:

> “This framework is based on a simple premise: if we treat school activity in terms of learning, playing and helping, then we can more thoroughly engage children in the learning process” (p. 16) and further, “It is at the intersection of these three that motivation is situated” (p. 19).

In addition to the four elements of intrinsic motivation identified by Malone and Lepper (1987 cited in Barab et al 2005, p. 20), interviews revealed the importance of ten additional elements: identity presentation; social relations; playing; learning; achievement; helping; rewards; immersion; uniqueness; and creativity (p. 20).

The quality of Quest Atlantis is evidenced by the fact that children enjoyed it more than they enjoyed school but they did not rate the latter as significantly higher than the former on the learning dimensions (p. 18). Through Quest Atlantis, player-learners showed significant learning gains in sciences, social studies, language arts and metacognitive skills (p. 19).

In both aforementioned designs, experiential learning (Kolb 1993) is the obvious process by which children learn (e.g. Price et al 2003, pp. 178-182). At this point, it is worth drawing a parallel between, on the one side, the physical exploration of the world that enables children to learn, and on the other, the more cognitive exploration of an abstract world that enables adults to learn effectively: the mental manipulation of concepts which constitutes the action in symbolic systems (Csikszentmihalyi cited in Webster and Martocchio 1992, p. 202) is at the core of what is meant by academic playfulness in the present study.

Likewise, experiential approaches to course design based on Knowles' concept of andragogy aim at increasing students' motivation by embedding their personal goals into the courses' academic goals (Knowles 1984 cited in Smith 2002): in effect, one of the fundamental assumptions of andragogy is that, “as a person matures, the motivation to learn is internal”. Consistent with that view, “many of the new developments in education put a heavy responsibility on the learners to take a good deal of initiative in their own learning”, that is,

to become self-directed (Knowles 1984 cited in Smith 2002). Successful exploration of the academic world accessible to students therefore depends on the degree to which they embrace the relative freedom that they are offered. In so doing, they often face a difficult dilemma in the sensitive context of assignments: the outcome of the conflict between "getting the grade" and "really learning something" (Beaty et al 2005, p. 74) depends on students' motivational orientation, which, as discussed above, might be mediated by their self-efficacy (Bandura 1997 cited in Bruning et al 1999, p. 112). This association is supported by the ever-present link between motivation and both the general trait and the situation-specific trait of playfulness in the literature: indeed, as outlined above, Dewey describes playfulness as "the capacity to draw satisfaction from the immediate intellectual development of a topic, irrespective of any ulterior motive" (1913 cited in Webster and Martocchio 1992, p. 204).

2.3.3. Motivation as a conceptual lens for "academic playfulness"

Motivation to move from one state to another can be understood through the prism of the theory of Cognitive Dissonance: it posits that cognitive dissonance in one's mental structures is a powerful motivator for re-structuring. With children, "play begins, then, with the first dissociation between assimilation and accommodation" (Piaget 1950/62 cited in Casas 2003, p. 9) which occurs in dissonance. Good teachers have learnt to take advantage of that mechanism:

> "They stimulate the recall of inert knowledge so students can discuss it, and then introduce students to a new situation that produces cognitive dissonance. Once students can explain the phenomenon using a more critical and mature reasoning, the new information is linked to the prior knowledge structure and replaces it" (Sherry 1997).

Ideally then, educators must try to arrange learning experiences as an appropriate sequence of challenges to keep students motivated: Gee's central argument (2003) is that this is what games, especially video games, excel at.

The tension between "getting the grade" and "really learning something" which was previously discussed illustrates the two essential dimensions of a student's learning

orientation: this latter concept is defined by Taylor et al as “all those attitudes and aims which express the student’s individual relationship with a course of study and the university” (cited in Beaty et al 2005, p. 76). Beaty et and colleargues identify four main orientations to learning (academic orientation, vocational orientation, personal orientation and social orientation), the first three of which can be divided into intrinsic and extrinsic interests (2005 p. 76). Thus, students with an intrinsic academic orientation are mainly interested in studying a topic “for its own sake” and to follow their own intellectual interests whereas students with an extrinsic academic interest are primarily interested in progression through the educational system, which often means passing the course and getting the degree. The authors note that the latter category tend to be much more competitive and to want clearer guidelines than the former (pp. 78-79).

From a sample of 1,363 undergraduates and 1,055 working adults, Amabile et al specifically designed the Work Preference Inventory (WPI) as a research tool for assessing individual differences in intrinsic and extrinsic motivational orientations (1994). They created two very close versions of the instrument for both students and workers, each taking account of the specificities of the person's context. In effect, Beaty and colleagues argue that in describing a learner's learning orientation, one should take account of both institutional and personal contexts for study (2005, p. 73). Consistent with this (p. 959), Amabile believes that learning orientations may exist as relatively stable individual differences, thereby emphasizing the importance of the latter context (1988 cited in Amabile et al 1994, p. 951). Likewise, Harter developed a scale of intrinsic and extrinsic motivation for elementary school children composed of five sub-scales: preference for challenge vs. preference for easy work; curiosity/interest vs. pleasing the teacher/getting good grades; independent mastery vs. dependence on the teacher; independent judgment vs. reliance on the teacher's judgment; and internal criteria for evaluation vs. external criteria for evaluation (1981 cited in Amabile et al 1994, p. 951). Opposite to traditional views implied by research on intrinsic and extrinsic motivation, some researchers, including the creators of the WPI, have found that they can sometimes co-occur and are therefore best understood as two unipolar constructs (p. 959).

The authors developed the Work Preference Inventory in order to assess the extent to which individuals perceive themselves to be intrinsically and extrinsically motivated towards what they do. The elements of intrinsic motivation measured by the WPI include self-determination (preference for choice and autonomy); competence (mastery orientation and preference for challenge); task involvement (task absorption and flow); curiosity (preference

for complexity); and interest (enjoyment and fun). For extrinsic motivation, these elements include evaluation concerns; recognition concerns; competition concerns; a focus on money or other tangible incentives; and a focus on the dictates of others (p. 952).

Exploratory factor analyses were used to identify two levels of motivation: the Intrinsic Motivation primary scale is made up of the Challenge and Enjoyment secondary scales whereas the Extrinsic Motivation primary scale is composed of the Compensation and Outward (orientation toward the recognition and dictates of others) secondary scales.

A likely weakness of the WPI lies in the placement of the items on those various secondary scales. For instance, “I want to find out how good I really can be at my work.” belongs to the Enjoyment scale whereas it would arguably fit better on the Challenge scale. As a result, care must be taken before interpreting the scores on these secondary scales.

The literature on the situation-specific trait of playfulness has enabled the idea of learning motivational orientation to emerge as a better concept covering the behaviours characteristic of playfulness in an academic setting. As a result, “academic playfulness” is to be understood in terms of learning orientation in this study. Although “academic playfulness” seems much closer to intrinsic than extrinsic motivation, both needs to be considered since extrinsic motivators can sometimes lead to playful learning behaviours. For instance, when grades are constructively aligned (Biggs 2003) with such assessment criteria as exploration of unfamiliar content or creativity, even students who are mainly extrinsically motivated are likely to exhibit some “playful” academic behaviours. Moreover, reward, especially social reward, can increase intrinsic motivation (Cameron and Pierce 1994). Overall, these researchers only found a small negative effect when tangible rewards were given without consideration of performance. Contrary to other findings, this supports Amabile et al’s belief that extrinsic and intrinsic motivation are not always negatively correlated (1994, p. 959).

The student version of the WPI (in its seventh version) was chosen because it shows good validity and reliability and matches the needs of this study:

“The WPI should be useful for research on intrinsic motivation, extrinsic motivation, and motivation in general[....] It may also be useful in integrating concepts of motivational orientation into more general personality theories” (p. 966).

2.3.4. Operational definition of academic playfulness

Based on Amabile et al's Work Preference Inventory (1994), a student's academic playfulness is, in the proposed study, understood in terms of their levels of Intrinsic and Extrinsic Motivation. Intrinsic Motivation is itself made up of the Challenge and Enjoyment sub-scales whereas Extrinsic Motivation is composed of the Compensation and Outward sub-scales. Participants are asked to indicate the extent to which each item describes them on a 5-point Likert-scale.

A student's levels of intrinsic and extrinsic motivation are the sum of their scores on each of the primary scales adapted from the WPI (Amabile et al 1994).

2.4. Social desirability

As underscored by many researchers (Crowne and Marlowe 1960, p. 350; Robson 2002, p. 233), personality and attitudes test scores are often affected by non-test-relevant factors. One such factor, known as social desirability, represent individuals' tendency to “present themselves in a favourable light “(Crowne and Marlowe 1960, p. 350). For instance, in the proposed study, some participants may be inclined to agree with the sentence “Curiosity is the driving force behind much of what I do” even if it is not the case because they know that is valued by our society. The varying degree to which individuals exhibit social desirability can diminish the validity of most studies, including the present one. It would therefore have been helpful to measure respondents social desirability so as to be able to assess the trustworthiness of the findings of this study.

Crowne and Marlowe developed and assessed such a scale (1960): it contains 33 items which are culturally approved and are unlikely to occur at the same time. Importantly, these items have “minimal pathological or abnormal implications if responded to in either the socially desirable or undesirable directions” (p. 350). The development of the instrument was focused on the student population (p. 350) and given its good reliability, it seems appropriate to the present study. However, with 33 items, which is considerable as compared to the main questionnaire, this scale is not really usable in the context of the present study because it could be detrimental to the response rate.

Some researchers have created short forms of Crowne and Marlowe's instrument (1960) but these do not necessarily fit the population of this study: Ray states that such scales “may have satisfactory alphas with general population samples” (1984, p. 134) such as army conscripts. Nevertheless, he notes that university students are less representative of the general population intellectually, educationally and socioeconomically. (p. 133). Mandell (n.d.) recommends Strehan and Gerbasi's M-C 1, which is least affected by age and socioeconomic status, in cases where practical problems such as respondent burden are likely. Assessing the factorial validity of both Crowne and Marlowe's tool and theirs, Leite and Beretvas warn about social desirability scales as a whole (2005).

Consequently and given the scope of the present study, it was chosen not to administer any formal social desirability questionnaire.

But since social desirability represents a form of extrinsic motivation, the adapted version of the WPI (Amabile et al 1994), and more particularly, its Outward secondary scale, will be used to try to predict, to a certain extent, which data is more likely to be biased in a social desirable direction.

3. Research design and methods

3.1. Research questions

The research questions were refined based on the insights that were gained while reviewing the literature about playfulness. In particular, the notion of “academic playfulness” was re-conceptualised into learning motivational orientation. As a result, the present study aims to assess whether there is any link between an individual's general trait of playfulness and their learning motivational orientation in higher education. It also aims to identify possible intervening mechanisms in that hypothetical link.

3.2. Epistemology and theoretical perspective

Crotty highlights the importance of making explicit the epistemology and theoretical perspective which inform the methodology and methods used to answer the research questions (1998).

The present study is based on a constructivist epistemology: I believe that knowledge is created in and out of our interactions with the world, including others (Crook 1994; Gee 2003). Therefore, different people may construct meaning in different ways.

Related to this epistemological stance, a phenomenological perspective is adopted in trying to identify potential mechanisms which could link playfulness to learning orientation.

3.3. Methodology and methods

The present study follows a non-experimental fixed design. According to Robson (2002, pp. 154-159), such a methodology is commonly used for descriptive purposes as it makes it possible to identify patterns within the data, such as the link under consideration. Those can, in turn, inform the theory refined based on the literature review and which is reflected here in

the first research question. In addition to that, such a strategy allows the collection of qualitative data: indeed, both types of data can helpfully supplement one another and provide a richer understanding of the topic of interest (Robson 2002): in this study, an online questionnaire and 5 interviews were respectively mainly used to inform the “what” and the “how” of the link between playfulness and learning orientation. In other words, the quantitative data mainly informed the first research question while the qualitative data helped answer the second one.

The implementation of the questionnaire instruments involved the adaptation of existing scales (Amabile et al 1994; Barnett 2007), their translation to the French language, a short pre-test, a formal pilot and, eventually, the deployment of the final online version. People taking part in these various stages are described in the following section.

3.3.1. Participants

Main study

The population of interest is higher education students, especially those within Western countries.

Accessing a sampling frame for all Western students was obviously not possible and therefore, convenience sampling was chosen: based on my contacts, one group of Masters students in Education from the University of Edinburgh as well as 10 groups of undergraduate (Level 3) and Masters students from various fields (Fine Arts, Education, Humanitarian Management, Management, Urbanism, Human Resources, Information and Communication, Physics and Chemistry, Computing and Sociology) enrolled in French universities were approached by email: a total of 230 students were asked to volunteer to answer the online questionnaire over a period of 4 weeks.

A minimum number of 50 participants was desired to enable a meaningful analysis: 70 people took part, resulting in a response rate of 30.4%.

Additionally, 5 interviews were conducted to explore the possible mechanisms by which playfulness can impact a student’s motivation to learn. The criteria which guided participants' recruitment are described below.

Pre-test and pilot

Although most of the questionnaire was derived from Amabile et al's proven WPI (1994), the quality of the questions based on Barnett's playfulness scale (2007) as well as those which were added to record demographic and personal information was not known. Further, the validity of my translation of the questionnaire items from English to French needed to be evaluated by specialists. As a result, a validation of the translation followed by both a pre-test and a formal pilot stage were scheduled.

Given my level in both English and French and since meanings can be easily clarified during an interview, no such stages were planned for the interview guide.

For convenience of access, all 6 translators and pre-testers were friends and relatives (3 females and 3 males) who were neither familiar with the University of Edinburgh nor with the goal of the study.

First, a French teacher in a British school and a French bilingual worker were involved in validating the English-French translation.

Next, one worker pre-tested the English version of the questionnaire while three people, including one student, pre-tested the French version. Given that the French version was new, this distribution, despite involving small numbers, seems satisfactory.

A formal pilot was then conducted to improve both the questionnaire and the covering letter: 10 people from the population of interest were contacted. Half of them were British students in Education, the other half being French students from other fields, including Arts and Social Research. 3 British students did not respond and 7 formal testers filled out the questionnaire and provided comments on both the tool and the covering email.

Despite follow-up emails being the most productive factors to increase response rate in surveys (Robson 2002, p. 250) and therefore, to increase the generalizability of the results, it

was decided not to send any: first, the number of responses for this small study was respectable and above my target of 50 and as a consequence, follow-up emails may only have had a slightly positive effect. Next, I knew that students were very busy at that period and used to be approached for other studies as well. As a result, I decided not to overload them, which was also hoped to enable them to take part in studies that really lacked participants.

3.3.2. Online questionnaire

The online self-report questionnaire represented the main data collection method and was primarily intended to statistically assess the existence of the potential link between a student's playfulness and their learning orientation. The adaptation of the instrument is detailed below:

The first page in the main part of the questionnaire is adapted from the measure of playfulness created by Barnett (2007) whereas the second page is adapted from Amabile et al's Work Preference Inventory (1994). In addition to that, informants provided some demographical and personal information.

This method of data collection is supported by Robson who believes that questionnaires are appropriate to the study of attitudes (2002, p. 233) and by Glynn and Webster who say that:

> “playfulness is a multidimensional construct, encompassing cognitive, affective, and behavioural components, which together constitute a continuum along which individuals range from low to high”. (1992, p. 85)

Sandelands and Buckner concur: “self-reports are the most appropriate methods for measuring playfulness” (1989 cited in Webster and Martocchio 1992, p. 217). Indeed, it would be difficult to rate participants' trait of playfulness by observational techniques alone, for people's behaviours in a research setting may also reflect other constructs than playfulness (e.g. Webster 1989 cited in Webster and Martocchio 1992, p . 217). Moreover, online self-report instruments are very appropriate to reach, over a relatively short period of time, participants spread across a wide geographical area. Knowing the relatively short time

available here, the last major reason to use a quantitative instrument as the main data collection technique is that it decreases the time required for data analysis.

With regards to the epistemology underlying the present study, Crotty states that it does not rule out quantification, for human beings almost constantly measure aspects of life that are usually regarded as subjective (1998, p. 15): through the constructivist lens, individuals may be thought to generate a quantitative judgement of some of their own characteristics out of the interactions they have with themselves and, more specifically, with their past experiences and reflections.

Barnett states that her instrument:

"presents a cogent way in which to define and measure playfulness in young adults, thereby serving as an important starting point for future research". (2007, p. 957)

Her view of playfulness as a trait, the match with the population of interest in the present study and the anticipated helpfulness of the playfulness sub-scales in answering the research questions are the main practical reasons which led to the choice of that specific instrument. On a conceptual level, this is further supported by her view that play and work are sometimes compatible.

Secondly, the seventh version of the WPI (Amabile et al 1994) was chosen to measure motivation because it shows good validity and reliability and because it matches the need of the present study:

"The WPI should be useful for research on intrinsic motivation, extrinsic motivation, and motivation in general[....] It may also be useful in integrating concepts of motivational orientation into more general personality theories" (p. 966).

Next, since relevant instruments were previously developed (Amabile et al 1994; Barnett 2007; Glynn and Webster 1992-1993) and that some of them were validated, they can also considerably simplify the study and partially safeguard against threats to internal validity resulting from my lack of experience as a researcher. However, the main downside of questionnaires is that they usually impede generalizability, for they often generate a low

response rate. However, an intriguing covering letter that highlighted a personal benefit helped overcome this barrier as it encouraged potential participants to take part.

In order to reduce the risk of getting social desirable responses, participants could choose to either complete the questionnaire anonymously or to provide their email address: they were told that it might be used to contact them for further questions (interviews) as well as to send them the results of the findings if they were willing to know them. Since I provided my email address on the questionnaire, results could also be requested directly, without filling out the relevant field.

On the Data Protection page at the beginning of the survey, participants were informed that data would be reported anonymously, in an aggregated form and that results would only be shared with relevant University of Edinburgh staff. Using informed consent, they were explained that their progression to the page that followed would mean their acceptance of the stated terms.

The covering letter for the questionnaire, in both English and French is shown in Appendix A.

The English and French final versions of the questionnaire adapted from Barnett (2007) and Amabile et al (1994) are shown in Appendix B.

Initial changes

Robson advocates that questions about subjective elements such as feelings or self-judgements like those that are part of Barnett's instrument (2007), be written on the first-person mode (2002, p. 246) so as to facilitate projection and, eventually, identification or rejection. Nevertheless, it appeared difficult to reword them without detracting from the validity of the scale and therefore, they were re-used directly from the original instrument (Barnett 2007). Secondly, the wording of the questions in that tool are a little ambiguous since it can either refer to general traits or situation-specific ones. As a result, a note was added to inform participants to consider the former.

She also outlines the importance of leaving a “No opinion/Not sure” possibility rather than “creating opinions” (2002, p. 246). Therefore, the list of possible answers to Amabile et al's WPI was added such a possibility.

Dawes examined how using Likert-scales with either a 5-point, 7-point or 10-point format affects the resultant data in terms of mean scores, and measures of dispersion and shape (2008). He found that, after re-scaling, the 5- and 7-point versions resulted in the same mean score as each other. However, the 10-point version tended to produce slightly lower relative means than either the 5- or 7-point formats. The researcher used a scale about price-consciousness that looks at consumers attitudes (p. 67), which is similar, in nature, to the items in the WPI (Amabile et al 1994).

In the present study, it was hypothetized that 4- and 5-point scales would produce similar results.

In a randomized comparison of a 4- and 5-point Likert scale version of the Norwegian Function Assessment Scale (NFAS), Østerås and colleagues (2008) found that “the five-point scale version had better data quality in terms of missing data, end effects at the item and scale level, as well as higher levels of internal consistency”. Even though the NFAS asks situation-specific questions, these findings may extend to the WPI (Amabile et al 1994): enabling participants to provide a neutral answer may result in more faithful and valid answer than forcing them into a false assertion. Nonetheless, that change slightly diminishes the ability to compare results from this study with that of Amabile et al (1994).

Information about the goal of the study, data protection issues and informed consent were added at the beginning of the questionnaire whereas questions about participant's age, sex, field of study, level of study and email address (optional field) were added at the end.

Translation validation and informal pre-test

When my translation of the instrument from English to French was ready, one French teacher in an English school as well as one young French worker who had studied in the UK a few years ago were approached to improve the paper translation: they were asked to provide suggestions on how to make the wording more natural and, most importantly, how to make the French version as faithful as possible to the English one. This is fundamental to make it

possible to compare the answers to both versions and to analyse them together, as if they came from the same tool.

Based on the feedback from these two people, the French version was revised and a few minor changes were also done to the English one:

- Typographical errors and spelling mistakes were corrected.
- A few translation mistakes were also fixed: thus, the original translation of “Adventurous” to “Aventureux” was changed to “Téméraire”.
- The wording of some items from the original version was changed: for instance “fools around” and “studies” were used instead of “clowns around” and “work” respectively. However, the initial wording was sometimes kept so as to facilitate the participants' projection: for example, “I am concerned about how other people are going to react to my ideas” was kept instead of the tranlator’s proposed “I am concerned about how other people react to my ideas”.

Pre-testers were then approached by email and told to imagine they had to answer the questionnaire: one was an employee in the UK, two were French young employees and another one was a French student. They were asked whether they found everything simple, clear and unambiguous. They were also asked to provide comments and suggestions which they thought would improve the questionnaire.

Based on that feedback, a number of further improvements were made:

- More typographical errors, missing punctuation and spelling mistakes were corrected.
- On the French instrument, female alternatives to male adjectives were added on the page where I had omitted them
- A section which had not been translated was translated to French
- A few sentences such as “All results will be reported in aggregate form” and “results will be reviewed within this institution” were clarified

The electronic version of the questionnaire was created to reflect these improvements: the BOS tool (Bristol Online Surveys n.d.) was chosen because I was familiar with it and

because it made it relatively easy to create a multi-lingual questionnaire. Due to a translation mistake for the “More Info” button noticed in “Building” mode, the note about the trait/state distinction was implemented differently on the French questionnaire than on the English one.

Formal pilot

For the formal pilot stage, 10 people from the population (3rd year undergraduates and Masters students) of interest were approached to improve both the questionnaire and the covering letter: as for the pre-test, they were asked whether they found everything simple, clear and unambiguous. In addition to that, they were asked how long it took them to answer the survey, to mention any particular thoughts that occurred to them while answering it and any suggestions they would make to improve it. Finally, they were asked whether they found the covering letter intriguing enough to encourage them to take part and how it could be improved.

Interestingly, and in opposition with Robson (2002), the Social Research student who took part in this pilot explained me that while she was on placement in France's leading statistical institute, she had been advised to avoid including a neutral possibility, for it often results in a phenomenon she called “l'attraction du centre” (attraction to the center). Answers given at the pilot stage were looked at to check whether the the phenomenon was very influential: since it was not, the “Not sure/Don't know” choice was kept. This decision is consistent with Robson's suggestion (2002) and with the above discussion on Likert-scales.

This formal pilot further helped improve the questionnaire and the covering letter:

- A few more spelling mistakes were corrected.
- The readability of the questionnaire was improved by displaying the questions in bold.
- The content of the introductory pages of the questionnaire was clarified
- The wording of one question in the English version was improved
- To highlight the possibility to answer the questionnaire anonymously, the word “Optional” was displayed for the email field.

- While making those changes, I noticed that I had omitted one question for the French version and I therefore added it.
- The wording and the content of the covering letter was improved (some content was removed and a word on anonymity and confidentiality was added).
- The initial suggested completion time was changed to “5 to 10 minutes”.

Since no major changes were required and since the feedback on the covering letter was very encouraging, it was decided that the instrument was ready for the main data collection stage.

3.3.3. Online semi-structured interviews

The online interviews were helpful to supplement quantitative data to further inform the first research question. They were mostly used to fulfil the second goal of this project by identifying the mechanisms underlying the subject of interest and which are hypothesized based on the review of the literature (see below): therefore, following an inductive approach, they can help explain or clarify any link between general playfulness and motivation (Robson 2002, p. 271).

In the constructivist view of knowledge, different people can create meanings in different ways: making explicit and reflecting on both these meanings and the processes by which they are constructed is fundamental in trying to understand as best as possible the mechanisms under scrutiny.

Semi-structured interviews were chosen as the perfect supplement to the quantitative approach so as to allow for more flexibility in the process: prepared questions may be asked in a different order to that planned so as to give more freedom to the respondent and to explore unanticipated paths.

A mix of convenience and purposive sampling was used to approach potential interviewee. First, they were selected and approached so as to form a representative group in terms of gender and field of study: One interviewee was a Fine Arts student, one was a Music student, two were Education students, and another one was studying Information and Communication Sciences. There were three males and two females. Two were students from the University of Edinburgh and three studied in France. Second, only people I knew and whom I considered

to be highly playful, both in general and in their studies, were asked to take part: this choice was led by the second research question which seeks to establish the mechanisms by which general playfulness can impact a student's learning motivational orientation.

They were contacted by email to arrange the day and time for an interview that was expected to last about 30 minutes.

These text-based conversations were recorded at a distance via an asynchronous discussion tool (Skype 2009): even though voice- or video-based discussions were possible, text conversations were chosen for ease of analysis, given the resources at my disposal. Such media might also enable more elaborate responses than direct voice chats since people can reflect on and edit their answers before submitting them.

Interviewees consent was asked for after introducing them to my background, the purpose of the study, the way data was to be handle and the way findings were to be reported (the same policy as that used for quantitative data applied).

The development of the interview guide is briefly described in the following section.

Interview guide

The main mechanisms in the hypothetical link between general playfulness and learning orientation which can be drawn from the literature are:

- active engagement (e.g. Gee 2003, p. 59)
- personal interest, pleasure, happiness (e.g. Glynn and Webster 1992, p. 85; Newmann 2004, p. 19-20)
- innovation and creativity (e.g. Price et al 2003, p. 170)
- new experiences, challenge, achievement, self-efficacy (e.g. Barab et al 2005, p. 20; Shell et al 1995 cited in Bruning et al 1999, p. 113; Tan and McWilliam 2008, p. 3)

Based on a constructionist perspective and consistent with the more exploratory approach that it allows, qualitative analysis can be seen as a process of interplay between data and theory: as Charmaz puts it:

> “sensitizing concepts and disciplinary perspectives provide a place to start, not to end. Grounded theorists use sensitizing concepts as tentative tools for developing their ideas about processes that they define in their data.” (2006, p. 31).

Since the second and fourth interviews made social relationships and reflection respectively emerge as additional potential mechanism, the interview guide was added those mechanisms for subsequent interviews: this was done so as to try to provide for more complete findings. Interestingly, the latter was underscored by Price et al (2003) but since it was not prevalent in the literature, it had not been included from the beginning.

It is worth noting that these mechanisms are very much related to one another and that the way they were classified in this study could probably be improved by future works.

Even though participants were explicitly asked to rate themselves on playfulness, the term can be ambiguous. Therefore, and in agreement with Sutton-Smith's categories of play, the terms “pastimes” and “hobbies” were used instead. The assumption is that individuals can only be said to be playful if they manifest this trait via any combinations of the following: mind or subjective play; solitary play; playful behaviours; informal social play; vicarious audience play; performance play; celebrations and festivals; contests (games and sports); risky or deep play (1997, pp. 4-5).

The final version of the interview guide in both English and French is shown in Appendix C.

4. Results

4.1. Survey results

A number of simple manipulations was done to prepare the data exported by the BOS tool (Bristol Online Surveys n.d.) to be imported and analysed in SPSS (Statistical Package for the Social Sciences 2006).

4.1.1. Data coding

Before combining the outputs from both questionnaires, the records were added a variable corresponding to the participant's country of study (UK or France).

Given the small number of participants from some courses and in order to facilitate comparison of the results with other studies, students' exact field of study was replaced by their functional orientation based on Glynn and Webster's definitions:

> "we differentiate between relatively more qualitative fields (e.g., liberal arts, management) which typically encourage greater social interaction and relatively more quantitative fields (e.g., economics, finance), which typically encourage more solitary action" (1992, p. 86).

Thus, fields such as Education, Communications and Management were translated into a qualitative functional orientation whereas Computing and Demographics were translated into a quantitative functional orientation.

Next, relevant items from the adapted version of Amabile et al's WPI (1994) were reverse-coded.

The second coding stage involved the computation of (a) the playfulness scale and its sub-scales (Barnett 2007, p. 953) and (b) the intrinsic and extrinsic motivation scales and their sub-scales (Amabile et al 1994, p. 956) based on the operational definitions of the constructs provided earlier.

4.1.2. Descriptive statistics

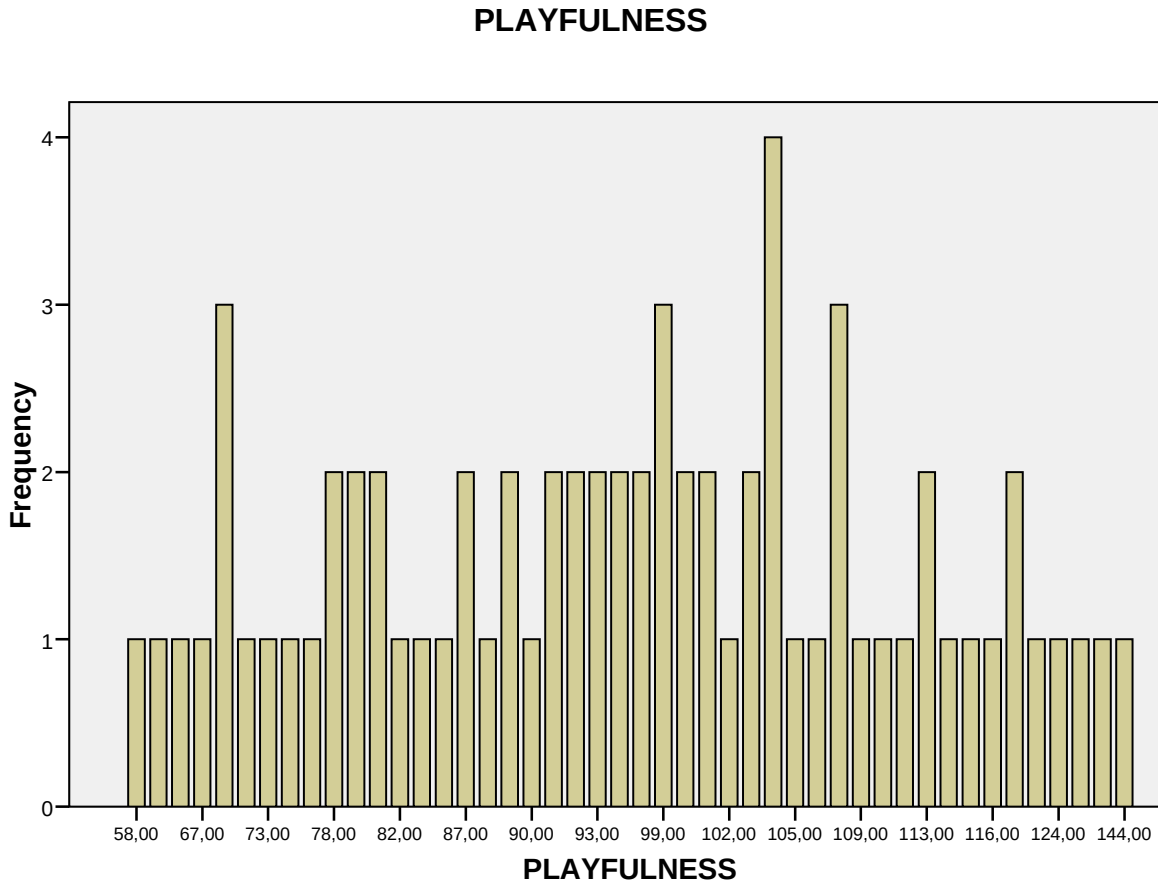
There were 49 female (70%) and 21 male (30%) respondents, corresponding to 30.4% of the people approached. The 70 respondents were equally divided between British (35) and French universities (35).

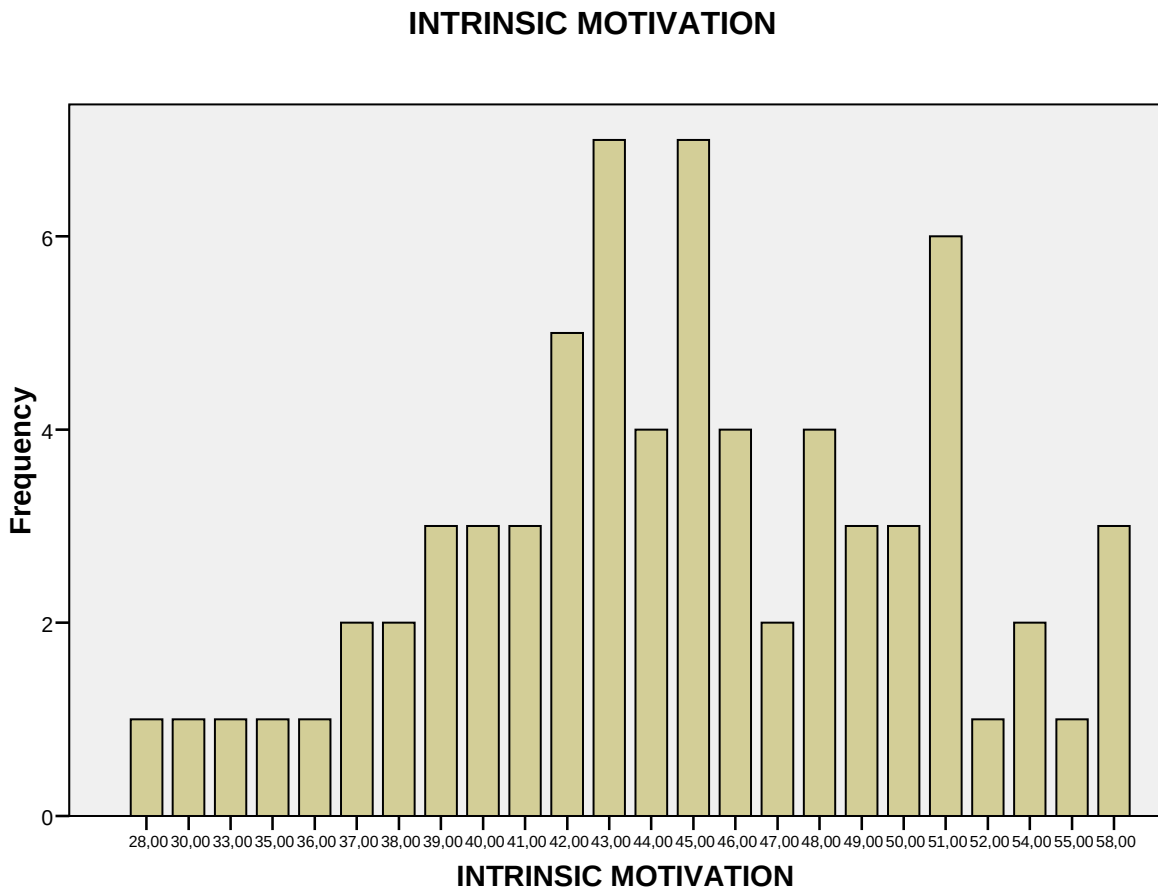
Sixty-six (94.3%) studied at Master's level and the remaining 4 were Level 3 students.

Fifty-two students (74.3%) had a more qualitative functional orientation and 18 (25.7%) had a more quantitative one.

To calculate the average age of the respondents, the median was chosen as the data was not normally distributed: the median age was 30.

Figure 1 illustrates the distribution of the data on the Playfulness, Intrinsic and Extrinsic Motivation scales, which represent the main scales of the questionnaire:


PLAYFULNESS
Frequency
0
1
2
3
4
58,00
67,00
73,00
78,00
82,00
87,00
90,00
93,00
99,00
102,00
105,00
109,00
113,00
116,00
124,00
144,00
PLAYFULNESS


INTRINSIC MOTIVATION
Frequency
0
2
4
6
28,00
30,00
33,00
35,00
36,00
37,00
38,00
39,00
40,00
41,00
42,00
43,00
44,00
45,00
46,00
47,00
48,00
49,00
50,00
51,00
52,00
54,00
55,00
58,00
INTRINSIC MOTIVATION

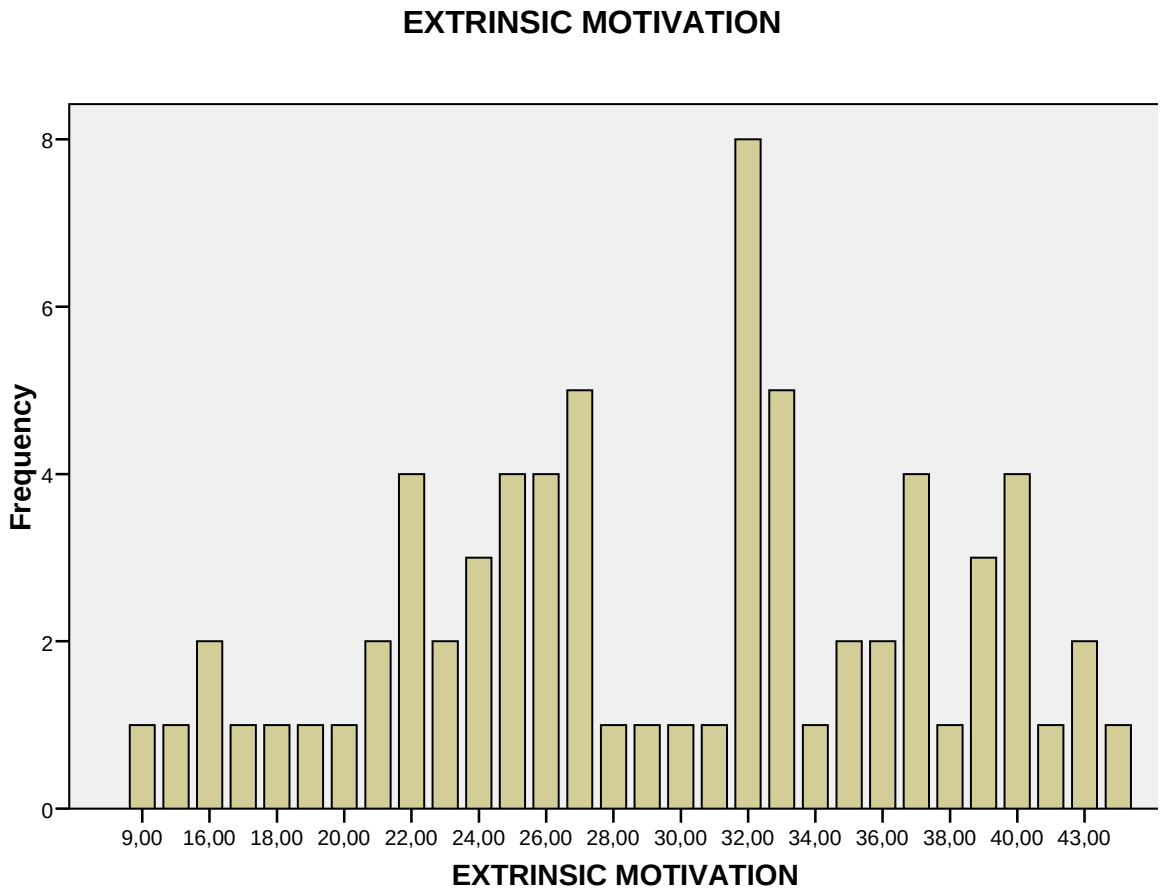


Fig. 1: Distribution of the data on the primary scales

Overall, the data on these main scales appear normally distributed.

The distribution of the scores on their component sub-scales is shown in Appendix D while the respective average scores are given in bold characters in table 1. As a safeguard, the median was used instead of the arithmetic mean when either (or both) the bar chart or the alignment between mean, median and mode did not very clearly reflect the normal distribution for any given variable.

	N	Mean	Median	Mode
PLAYFULNESS	70	**95,4143**	96,0000	104,00
GREGARIOUS	70	35,0857	**35,5000**	33,00a
UNINHIBITED	70	22,2429	**23,5000**	27,00
COMEDIC	70	24,5714	**25,5000**	29,00
DYNAMIC	70	13,5143	**13,5000**	12,00a
INTRINSIC MOTIVATION	70	**44,8000**	45,0000	43,00a
EXTRINSIC MOTIVATION	70	**29,4571**	30,5000	32,00
ENJOYMENT	70	**30,6000**	31,0000	29,00a
CHALLENGE	70	14,2000	**14,0000**	15,00
OUTWARD	70	24,6857	**25,5000**	19,00
COMPENSATION	70	4,7714	**5,0000**	6,00
Valid N (listwise)	70			

a Multiple modes exist. The smallest value is shown

Note: The preferred measure of central tendency (mean or median) is highlighted in bold

Table 1: measure of central tendency for the various scales

4.1.3. Confirmatory analysis

Independent t-tests were run to see if there was any statistically significant group differences in the scores on the Playfulness, Intrinsic Motivation and Extrinsic Motivation scales: no statistically significant differences was found for the various genders, functional orientations, level of study or country of study.

In particular, the very small gender difference on the Playfulness scale (mean=95,6735 for females and mean=94,8095 for males) is not statistically significant (p=0.853).

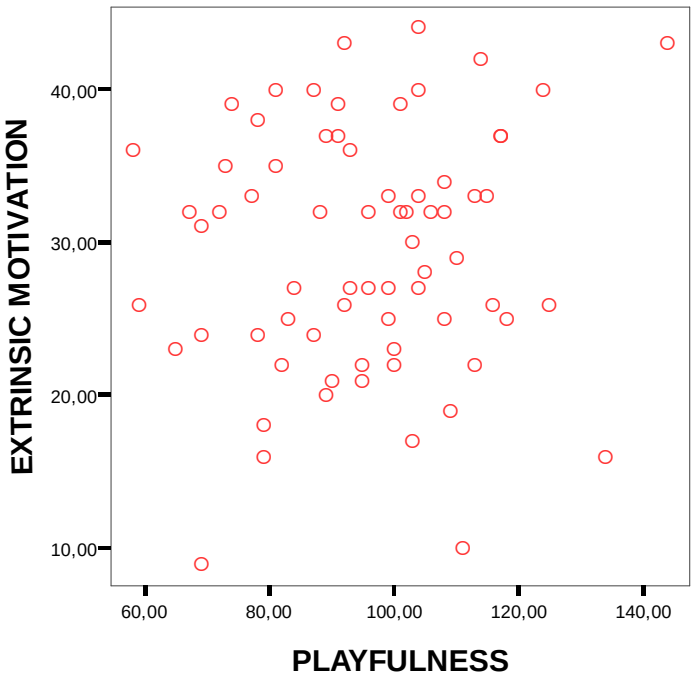
A Kendall's rank correlation coefficient shows that there is no age differences in individuals' level of playfulness either (r=0.012; p=0.888).

These data support past findings which, for the most part, indicate that playfulness is not related to either gender or age (e.g. Glynn and Webster 1992).

It is worth noting that the mean playfulness score for students associated with a qualitative functional orientation (97.0192) is higher than for those having a more quantitative functional orientation (90.7778) but this difference is not statistically significant (p=0.198). Although the present study does not enable direct comparison with that of Glynn and Webster who found that playfulness correlated negatively with quantitative functional orientations (1992), this result appears to suggest a similar relationship.

Playfulness and learning orientations

The following scattergrams show the relationship between playfulness and both learning orientations:



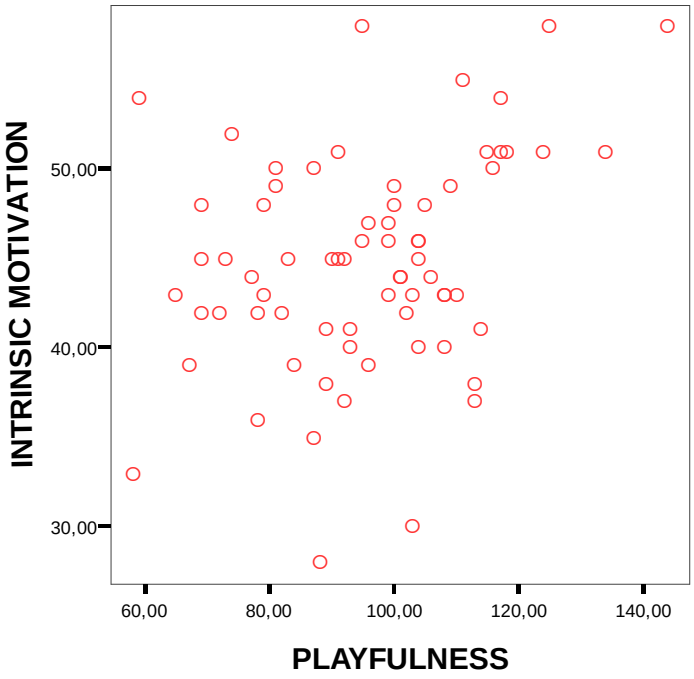


Fig. 2: scattergrams of the relationship between playfulness and both extrinsic and intrinsic learning orientations

As shown in the above graphs and in table 2, although playfulness is not related to extrinsic motivation, there is a small statistically significant linear correlation between playfulness and intrinsic motivation (r=0.324; p=0.006).

		INTRINSIC MOTIVATION	EXTRINSIC MOTIVATION
PLAYFULNESS	Pearson Correlation	,324(**)	,087
	Sig. (2-tailed)	,006	,472
	N	70	70

** Correlation is significant at the 0.01 level (2-tailed).

Table 2: Correlations between playfulness and both extrinsic and intrinsic learning orientations

Further correlation analysis were run to examine the relationship between intrinsic motivation and the various factors of playfulness identified by Barnett (2007). Since the scores on these factors do not clearly follow the normal distribution, a Kendall's rank coefficient was chosen instead of the parametric equivalent. Results are shown in table 3 below:

			INTRINSIC MOTIVATION
Kendall's tau_b	GREGARIOUS	Correlation Coefficient	,209(*)
		Sig. (2-tailed)	,014
		N	70
	UNINHIBITED	Correlation Coefficient	,197(*)
		Sig. (2-tailed)	,021
		N	70
	COMEDIC	Correlation Coefficient	,131
		Sig. (2-tailed)	,124
		N	70
	DYNAMIC	Correlation Coefficient	,174(*)
		Sig. (2-tailed)	,044
		N	70

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Table 3: Correlations between intrinsic motivation and the various sub-scales of playfulness

These findings suggest that the Gregarious and Uninhibited factors are more likely to play a greater role in the small association between a students' general level of playfulness and their intrinsic motivation to learn than the Comedic and Dynamic factors.

4.1.4. Exploratory analysis

The previously mentioned small association between playfulness and intrinsic learning orientation was examined with respect to the various groups represented in the sample of the population.

Interestingly, tables 4 and 5 below show that this small correlation varies between both genders: it is higher for males (r=0.384; p=0.086) than it is for females (r=0.304; p=0.034). Due to the small number of male participants, the relationship is not statistically significant for that group but this still suggests a possible interesting variation.

		INTRINSIC MOTIVATION
PLAYFULNESS	Pearson Correlation	,304(*)
	Sig. (2-tailed)	,034
	N	49

* Correlation is significant at the 0.05 level (2-tailed).

Table 4: Correlation between playfulness and intrinsic motivation for females

		INTRINSIC MOTIVATION
PLAYFULNESS	Pearson Correlation	,384
	Sig. (2-tailed)	,086
	N	21

Table 5: Correlation between playfulness and intrinsic motivation for males

This suggests that playfulness is slightly associated with intrinsic motivation and that this link may predominantly come from males.

Moreover, the link between playfulness and intrinsic motivation could be almost entirely mediated by the students' functional orientation since it is virtually non-existant for quantitative fields (r=0.068; p=0.789) as opposed to qualitative fields (r=0.397; p=0.004). However, the relationship is not statistically significant for the former group (N=18).

Relationship between intrinsic and extrinsic motivation

The scattergram shown on figure 3 highlights the relationship between intrinsic and extrinsic motivation

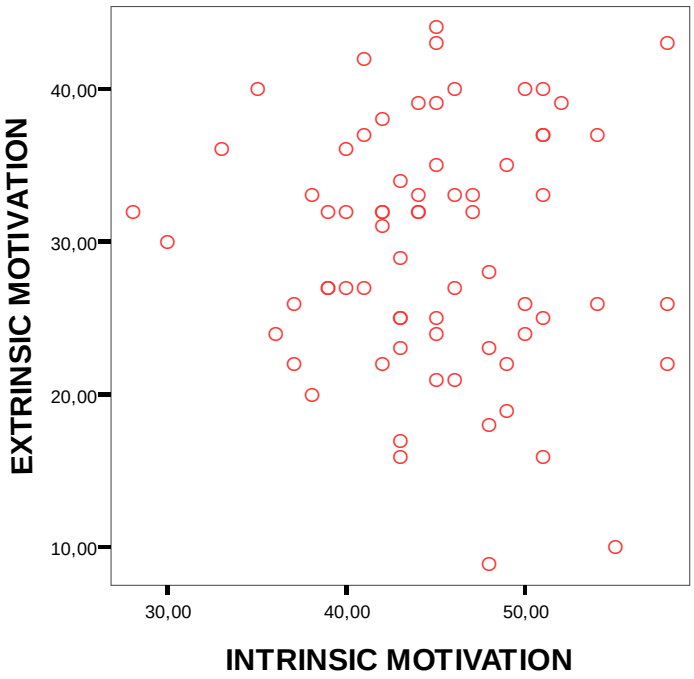


Fig. 3. Scattergram showing the relationship between intrinsic motivation and extrinsic motivation

A Spearman correlation coefficient indicates a very weak negative correlation between intrinsic and extrinsic motivation but it is not statistically significant (r=-0.074; p=0.543).

Consistent with Amabile et al (1994, p.959), the present study does not appear to support the common conception according to which intrinsic and extrinsic motivations are polar opposites of one single construct: indeed, the scattergram indicates that a given individual may simulateously exhibit high levels of both forms of motivations.

4.2. Interview results

The interviews aimed at clarifying the hypothesized association between general playfulness and intrinsic motivation to learn, which was, to a certain extent, informed by the quantitative analysis.

4.2.1. Data categorisation

First, reading the interviews interactively was crucial to enable a good familiarity with them.

During that stage, it was decided to remove the pleasure mechanism from the analysis as it is not a meaningful motivator in this context. Instead, it may be thought of as one of the main outcomes and rewards of playfulness which encourages one to carry on their activity. This decision seems to be supported by the fact that all interviewees mentioned pleasure as one of their most important motivations in both their hobbies and work.

Next, categories and their criteria were created based on the potential mechanisms appearing in the literature as well as those that the data made emerge. This iterative process of interplay between both sources of categories (Dey 1993) was facilitated by the overall alignment between hypothesized mechanisms and participants' personal perceptions and beliefs. The interviews were then imported and coded in HyperResearch 2.8 (2007) based on these categories.

The resulting categories and their criteria are shown in Appendix E

4.2.2. Interview analysis

To begin with, all interviewees rated themselves as being very playful in general, thereby confirming the perceptions I had of them and the appropriateness of their selection for examining the mechanisms by which general playfulness can impact on students' learning motivation.

Link between playfulness and intrinsic learning orientation

When asked whether there were common motivations behind the choice of their hobbies and that of their studies or work, four of the five participants strongly agreed.

One of the Education students was more ambiguous: he explained that both hobbies and work were motivated by his need for creativity, challenges and social relationships. However, he insisted that the latter was important to him as long as he could "manage it effectively" so that it did not impede his "freedom from interference". This can be explained by taking into account the strong need for creativity that this individual exhibited: he ranked it as the main reason motivating both his pastimes (the most important of which included artwork and singing) and study choices.

As expected, the link between pastimes and studies was very strong for the Fine Arts and the Music students:

"...actually, as you must suspect, in Fine Arts, hobbies, education everything blends. Since my studies are close to my heart, I think about them at any time; my work doesn't end during the weekend or when I go out of school, neither does it during the holidays [….] The interest I had for learning Fine Arts enabled it to enter my leisure life" (own translation)

"Yes absolutely, my study choices have been built on my pastimes. My pastimes became the subject of my studies." (own translation)

One of these two students indicated that, initially, he chose music in part as a personal hobby "in contrast to school". His studies at university later turned it into a passion.

He offers a good interpretation of the data presented above:

"If your leisure area is the same as that of school (one can be passionate about Maths) then your desire to learn will be increased tenfold" (own translation)

Conversely, it would appear that some individuals experience a tension between hobbies and work when the latter cannot accommodate the former. In those cases, hobbies often become an outlet for their playfulness as opposed to work. For one of the Education students:

"... it [pastimes] has to be fun! Some of my work is really depressing or demoralising so I need an outlet which is 'unconditionally happy'"

Nevertheless, the other Education student shows that this dichotomy between hobbies and work can evolve:

"After this interview i've come to realise that e-learning IS a hobby of mine. So my career choice/education has become a hobby"

Not only does leisure impact studies but the reverse seems to happen for some people as well, which supports the assumption according to which play and work can overlap. Very interestingly, it can happen in fields which are not necessarily highly artistic.

Extrinsic and intrinsic motivation

The previously quoted student initially provided extrinsic reasons to enrol on his course (the need in his job to know more about educational theory and getting a qualification which might help him to get jobs in the future). This proves that a primarily extrinsic learning orientation can later generate an intrinsic one.

Furthermore, the interview of one of the Education students shows that a given extrinsic motivation can sometimes be best understood in terms of another intrinsic one:

"It [decision to study] would also put me in quite a powerful position - knowing more than those with whom I'm discussing a subject [....] I think it has a lot to do with my creativity and need to experiment in an uninhibited way - if I know more about a subject than those around me then they are less likely to curtail my experimentation / expression than if they were my equals / better than me in my knowledge of the subject"

The above data supports Amabile et al's findings that intrinsic and extrinsic motivations can sometimes co-occur and are best understood as two unipolar constructs (1994, p. 959).

It is possible to transpose the previous observation to a more general level.

People who study topics that fully match their pastimes tend to be intrinsically motivated. Others might fall into two broad categories: those whose leisure and studies/work remain compartmentalized because they do not match their main components of playfulness (Barnett 2007, p. 955) and those whose studies and work gradually become hobbies. The former are more extrinsically motivated than the latter: for instance, some of them may regard money as an opportunity to fulfil the intrinsic motivation for their respective pastimes.

Common motivations to play and learn

Table 6 displays the frequency of each of the common motivators of hobbies and studies for each individual. Participants were probed with these motivators but it is important to note that since social relationship was added after the first interview and reflection was only added for the final one, their frequency is not very meaningful.

Common motivator	Frequency
Active engagement	3
Challenge / achievement	3
Creativity	4
Social relationships	4
Reflection	1

Table 6: frequency table of the common motivators between playing and learning

Since social relationships was a motivator for the first student on her free time (“visiting my friends”), it might also influence her study context.

Both the Fine Art and the Music students could be motivated by reflection since they highlighted creativity as one of their key reasons to study and reflection is an important part of the creative process. One of the Education students' hobbies (“a lot of artwork”, history, archaeology) as well as his desire to “know more than others” so as to give him the freedom to be creative seems to point to the same link. This does not appear to be the case for the

Communication student: despite citing creativity as one of her primary motivations to play and study, her favourite pastimes (“time with my friends and my boyfriend, walks, internet, shopping : in that order”) do not appear highly reflexive.

Overall, the empirical data concerning reflection in the present study and, on a conceptual level, its secondary role in the playfulness literature does not make it a strong motivator of both playing and learning.

Conversely, evidence from the interviews suggests that social relationships, creativity, active engagement and need for achievement and challenges represent prominent reasons for people to engage in hobbies and studies. Since they were all found to represent components of playfulness (Barab et al 2005, p. 20; Gee 2003, p. 59), they help understand how general playfulness impacts, to a limited extent, on an individual's “academic playfulness”.

The Music student pointed out that the reasons which were common to his desire to play and to learn contributed to his happiness. This seems to support the decision to remove pleasure from the list of motivations and to regard it as an outcome of hobbies, studies and work.

In addition to providing more data on the relationship between extrinsic and intrinsic motivation, the analysis of the data has shown a small correlation between playfulness and intrinsic motivation to learn in higher education.

Furthermore, this relationship depends on the students’ gender and, possibly, on their functional orientation as it is stronger for males and virtually non-existent for students from more quantitative fields.

It is likely that the small correlation found can be explained, in part, by students’ need for social relationships, creativity, active engagement and achievement. Another interesting finding is that not only playfulness influences people’s activity in terms of studies and occupations but that the reverse effect sometimes also occurs.

5. Discussion

5.1. Answers to the research questions

The quantitative and qualitative data collected helped understand the hypothesized link between an individual's level of playfulness and their learning orientation:

First of all, the trait of playfulness, understood as “the predisposition to frame (or reframe) a situation in such a way as to provide oneself (and possibly others) with amusement, humor, and/or entertainment” (Barnett 2007, p. 955) accounted for a small amount of the variance in the prediction of intrinsic motivation ($r=0.324$; $p=0.006$). This association is slightly stronger than that found by Glynn and Webster (2003, p. 1025): $r=0.29$; $p<0.01$.

Secondly, the relationship varied across genders: although non-significant, the correlation was greater for the male group ($r=0.384$; $p=0.086$) than for the female group (0.304; $p=0.034$) which took part in the study.

There is also a strong variation across functional orientation since the correlation came virtually exclusively from the participants studying qualitative subjects ($r=0.397$; $p=0.004$) as opposed to those in more quantitative fields ($r=0.068$; $p=0.789$). This finding is limited because it is not statistically significant due to the small number of participants from the latter group ($N=18$).

No definitive relationship between any of the four playfulness factors (Gregarious, Uninhibited, Comedic and Dynamic) identified by Barnett (2007) and intrinsic motivation was found, in spite of the hypothesis according to which the Uninhibited and Dynamic scales could have shown a strong correlation with intrinsic motivation. Likewise, Active and Adventurous did not show a statistically significant stronger correlation with intrinsic motivation than other items from the playfulness scale.

Respondent's motivation to play and learn or work was used as a conceptual lens which helped to illuminate this small association. Based on the motivators identified in the literature, participants identified social relationships, creativity, active engagement and need for achievement/challenges as their most important reasons to pursue hobbies and to learn and/or to work. This was highly relevant for learners of artistic fields for whom studies and

hobbies were extremely similar. Students from other fields explained that they were partially extrinsically motivated by their subject area. It appears that part of those people are frustrated when their studies or work leave little space for the expressiveness of their playful selves but interestingly, some other individuals manage to adapt to the demand of their studies or work and are sometimes even able to integrate them into their hobbies:

Gee's Identity Principle (2003, pp. 54-66) might help explain how some individuals move from being extrinsically to intrinsically motivated in an activity: in the present study, the student who moved from being extrinsically to intrinsically interested in Education did identify active engagement as one of his common motivations to play and learn. Nonetheless, more data is clearly needed to assess whether active engagement can consistently enable individuals to develop a genuine interest in activities which they do not initially enjoy.

5.2. Relationships to earlier findings

In addition to highlighting and helping explain a small relationship between playfulness and intrinsic motivation to learn in higher education, the present study adds to the current literature on playfulness and motivation in a number of ways:

The negligible negative correlation that was found between intrinsic and extrinsic motivation supports Amabile et al's findings (1994) that they can be best understood as two unipolar constructs. In fact, the interviews indicate, although distinct, intrinsic and extrinsic motivation mutually influence each other.

Consistent with Glynn and Webster (1992), playfulness was not associated with either gender or age in the present study. It could be inversely related to quantitative functional orientation but the difference found was not statistically significant.

Shell and colleagues argue that self-efficacy can sometimes generalise from one domain to another (1995 cited in Bruning et al 1999, p. 113): although the need for challenges was

consistently mentioned in the interviews as a motivation to both “play” and learn and seems to support that idea, more evidence is needed to confirm this theory.

5.3. Limitations

Given the small scale of this project, several elements lend credit to the approach that was chosen and the aforementioned findings: positives include the use of both quantitative and qualitative data, the number of participants coming from two different countries, the rigour in the adaptation and the test of the questionnaire instruments, the fact many participants enjoyed taking part and that the study helped some of them to learn about themselves and to consider their “work” in a different light.

Nevertheless, a number of limitations need to be taken into account when considering these results.

To begin with, no information was found concerning the validity and reliability of the playfulness instrument (Barnett 2007) that was used as part of the survey. Nevertheless, the similar correlations found between playfulness and intrinsic motivation in this study ($r=0.324$; $p=0.006$) on the one hand and in that of Glynn and Webster ($r=0.29$; $p<0.01$) on the other (2003, p. 1025) seems to indicate that both playfulness instruments provided a similar measure of playfulness.

Further, some respondents may have answered the online questionnaire in a social desirable way, which could detract from the quantitative results. No social desirability scale was used so as to limit the size of the final questionnaire and the extent to which participants answered in a social desirable light can only be approximated: the median score on the Outward sub-scale (25.5) might be used to provide a minimum estimate showing that this possible source of bias must not be underestimated (see table 1 for comparison with scores on the other motivation sub-scales). Conversely, it could be that people with a tendency toward social desirability score low on the Outward scale (Amabile et al 1994, p. 959) and therefore, it is also possible that social desirable responses remain invisible.

Another potential participants bias relates to the fact I know about half of the participants in this study, either personally or out of my learning interactions with them on this programme of study. In addition to that, my own lack of experience as a researcher together with the phenomenological approach chosen introduce a possible researcher bias.

Thirdly, since few people were interviewed and since they were not all probed on the same list of common motivators between pastimes and learning, the resulting findings cannot be generalised: they only represent a broad indication of how playfulness can impact learning and working.

Finally, even though the present findings are supported by comparison with the results of past studies (e.g. Glynn and Webster 2003, p. 1025), the constructivist epistemology adopted together with the sampling strategy used and the relatively low response rate (30.4%) limit their statistical generalizability to the overall students population. With regards to the response rate, there could be important differences between those who volunteered and those who did not which would have impacted the results (Robson 2002, p. 251): that is especially relevant to the numerous groups of students in French universities since few people from each group took part. Likewise, very little data was collected from undergraduate students (N=4).

5.4. Implications and further research

Taken together with existing theories and findings and keeping in mind their limitations, the results of the present study have a number of implications:

Educators should consider encouraging playful approaches and attitudes when teaching highly playful students because this could be seen as potentially supportive to their intrinsic motivation. Framed in terms of the various approaches to course design outlined by Toohey (1999), educators should consider providing academic content in different forms depending on the level of playfulness of their students: for instance, experiential/personal-relevance designs (pp. 59-63) may be more effective than traditional and performance-based designs (pp. 49-55) for highly playful students because they imply the concept of choice and a

stronger personal involvement. As was explained earlier, the stages involved in the process of experiential learning (Kolb 1993) are also very close to those built in learning activities for children which design aim to increase intrinsic motivation (Barab et al 2005; Price et al 2003). Pushing this idea further, high playfulness could be one of the key differences between students enjoying and benefiting the more from educational video-games and those preferring more traditional alternatives (Squire 2005).

In particular, educators may consider providing very playful students with more opportunities for active engagement, challenges (linked to self-efficacy), creativity and social relationships in order to try to increase their intrinsic motivation to study.

This suggestion could be very relevant for learners following more qualitative courses.

When such changes are not possible and when a learning activity is not very motivating, extrinsic rewards taking the student's performance into account (Cameron and Pierce 1994) could be considered: for some students, they may even represent a preliminary step toward intrinsic motivation.

Given the limitations previously mentioned, future research should try to provide more data to strengthen the empirical results of this study and to evaluate the assumptions made.

In particular, it would be helpful to assess the validity and the reliability of the playfulness instrument created by Barnett (2007), which the present study is based on.

It would also be helpful to investigate the link between playfulness and learning orientation using a probability sampling strategy on a wider scale because that would allow a better generalization of the findings to the global students population. Additionally, it would make it possible to clarify the role of gender and functional orientation in the small relationship between playfulness and intrinsic motivation.

Further, the questionnaire instrument used in future studies should ideally include a social desirability scale (e.g. Crowne and Marlowe 1960).

More research on the mechanisms which play a part in both playing and learning is also needed to lead to a better theoretical understanding of the small relationship found: for

example, it would be helpful to gather empirical data about the motivations to play and learn in a variety of study contexts as these might have an effect on the relative importance of these components of intrinsic motivation. Researchers may also consider carrying out a similar study with a more diverse population such as high-school students.

Related to the assumption made earlier with regards to Gee's Identity Principle (2003), future studies could also focus on evaluating whether deep and active engagement in an activity can help individuals with little initial interest in it to develop an intrinsic motivation over time.

There is also a need to further investigate the nature of the playful behaviours (exploration, experimentation, etc.) that are characteristic of intrinsic motivation: if future research shows that “academic playfulness” is a dynamic trait that can slowly change over time, schools and universities may try and create a learning environment that cultivates all students' playfulness. Reconnecting play and learning, which are differentiated from primary school onwards (Barab et al 2005, p. 15), would indeed represent a major change in today's students' learning path.

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Appendices

Appendix A

Covering email in English

Object: Play more to improve your grades?

If you'd like to feel better about practising your favourite hobby, sport, video game or about going out with friends when you should be revising, then please read on.

My Dissertation aims to study the link between a student's playfulness and his/her attitude while learning.

It would be much appreciated if you could take 5 to 10 minutes to fill out the following questionnaire as soon as possible and, ideally, within two weeks:
https://www.survey.ed.ac.uk/yl2009_playfulness_en

Your answers will remain confidential and all findings will be reported anonymously.
By the end of August, you may be able to regard play as your new academic tool.

For more information on this study, feel free to contact me at: youenn_leb@hotmail.com

Thank you in advance for your help,
Youenn Leborgne

Covering email in French

Objet : Jouer plus pour améliorer vos notes ?

Si vous aimeriez arrêter de culpabiliser en pratiquant votre loisir, sport, jeu vidéo favori ou en sortant avec vos amis alors que vous devriez réviser, alors ce qui suit va vous intéresser :

Mon mémoire a pour but d'étudier le lien entre le caractère joueur d'un étudiant et son attitude dans l'apprentissage.

J'apprécierais énormément si vous pouviez prendre 5 à 10 minutes pour répondre au questionnaire suivant le plus rapidement possible et, idéalement, sous deux semaines :
https://www.survey.ed.ac.uk/yl2009_playfulness_fr

Vos réponses resteront confidentielles et tous les résultats seront rapportés de manière anonyme.
Il est probable que d'ici fin août, vous puissiez considérer le jeu au sens large comme votre nouvel outil académique.

Pour plus d'informations sur cette étude, n'hésitez pas à me contacter à : youenn_leb@hotmail.com

Merci d'avance pour votre aide,
Youenn Leborgne

Appendix B

English version of the main parts of the questionnaire instrument

Item	Factor			
	Gregarious	Uninhibited	Comedic	Dynamic
Cheerful	X			
Spontaneous		X		
Fools around			X	
Active				X
Happy	X			
Impulsive		X		
Jokes/teases			X	
Energetic				
Friendly	X			X
Unpredictable		X		
Funny			X	
Outgoing	X			
Adventurous		X		
Humorous			X	
Sociable	X			

Playfulness scale adapted from Barnett (2007)

Notes:
- An X indicates the factor the item belongs to
- Participants were explained the difference between a personality trait and a short situational state and were asked to rate themselves on each of the 15 playfulness descriptors from 1 (very little) to 10 (a lot)

Proposition	Intrinsic Motivation Scale		Extrinsic Motivation Scale	
	Enjoyment	Challenge	Outward	Compensation
I am not that concerned about what other people think of my work.			R	
I prefer having clear goals set for me in my studies.			X	
The more difficult the problem, the more I thrive on solving it.		X		
I am fully aware of the goals I have for getting good grades.				X
I want my studies to provide me with		X		

opportunities to increase my knowledge and skills.				
To me, success means doing better than other people.			X	
I prefer to figure out things for myself.	X			
No matter what the outcome of a project, I am satisfied if I feel I gained a new experience.	X			
I enjoy relatively straightforward tasks.		R		
I am fully aware of the GPA (grade point average) goals that I aim to achieve.				X
Curiosity is the driving force behind much of what I do.		X		
I am less concerned with what I study than what I get for it.			X	
I enjoy tackling problems that are completely new to me.		X		
I prefer studying subjects I know I can manage over subjects that stretch my abilities.		R		
I am concerned about how other people are going to react to my ideas.			X	
I seldom think about grades and awards.				R
I am more comfortable when I can set my own goals.	X			
I believe that there is no point in doing a good job if nobody else knows about it.			X	
I am strongly motivated by the grades I can achieve.				X
It is important for me to be able to do what I enjoy most.	X			
I prefer working on projects with clearly specified procedures.			X	
As long as I can do what I enjoy, I am not that concerned about exactly what grades or awards I can earn.				R
I enjoy studying topics that are so absorbing that I forget about everything else.	X			
I am strongly motivated by the recognition I can earn from other people.			X	
I must feel that I am rewarded for what I do.			X	
I enjoy trying to solve complex problems.		X		
It is important for me to have an outlet for self-expression.	X			
I want to find out how good I really can be in my studies.	X			

I want other people to find out how good I really can be in my studies.		X
What matters most to me is enjoying what I do.	X	

Motivation Scale adapted from Amabile et al's Work Preference Inventory (1994)

Notes:
- An X indicates the primary and secondary scales the item belongs to and a R indicates that it is reverse-coded
- Participants were explained that the propositions refer to global attitudes in higher education and were asked to indicate how much they identified with each of them on a 5 point Likert-scale: 1) Strongly disagree; 2) Disagree; 3) Not sure/don't know; 4) Agree; 5) Strongly agree

French version of the main parts of the questionnaire instrument

Item	Factor			
	Gregarious	**Uninhibited**	**Comedic**	**Dynamic**
Gai(e)	X			
Spontané(e)		X		
Fait le clown			X	
Actif(ve)				X
Heureux(se)	X			
Impulsif(ve)		X		
Plaisante/taquine			X	
Energique				
Amical(e)	X			X
Imprévisible		X		
Drôle			X	
Se lie facilement	X			
Téméraire		X		
Plein(e) d'humour			X	
Sociable	X			

Playfulness scale adapted from Barnett (2007)

Notes:
- An X indicates the factor the item belongs to
- Participants were explained the difference between a personality trait and a short situational state and were asked to rate themselves on each of the 15 playfulness descriptors from 1 (very little) to 10 (a lot)

Proposition	Intrinsic Motivation Scale		Extrinsic Motivation Scale	
	Enjoyment	Challenge	Outward	Compensation
Je ne me soucie pas tellement de ce que les autres pensent de mon travail.			R	
Je préfère qu'on me donne des buts clairs dans mes études.			X	
Plus le problème est difficile, plus j'aime essayer de le résoudre.		X		
J'ai pleinement conscience des buts que je me fixe afin d'obtenir de bonnes notes.				X
Je veux que mes études me donnent des opportunités d'améliorer mes connaissances et mes compétences.		X		
Pour moi, le succès signifie faire mieux que les autres.			X	
Je préfère comprendre les choses par moi-même.	X			
Quelle que soit l'issue d'un projet, je suis satisfait(e) si je sens que j'ai acquis une nouvelle expérience.	X			
J'aime les tâches relativement simples.		R		
J'ai pleinement conscience de la moyenne que je veux obtenir.				X
La curiosité est à l'origine d'une bonne partie de ce que j'entreprends.		X		
Je me soucie moins de ce que j'étudie que de ce que j'en obtiens.			X	
J'aime m'attaquer à des problèmes qui sont complètement nouveaux pour moi.		X		
Je préfère étudier des sujets dont je sais que je peux les maîtriser que des sujets qui m'obligent à me surpasser.		R		
Je suis soucieux(se) de la façon dont les autres personnes vont réagir à mes idées.			X	
Je pense rarement aux notes et aux récompenses.				R
Je suis plus à l'aise quand je peux fixer mes propres objectifs.	X			
Je pense que ça ne sert à rien de faire du bon travail si personne ne le sait.			X	
Je suis très motivé(e) par les notes que je peux obtenir.				X
C'est très important pour moi de pouvoir faire ce que j'aime le plus.	X			
Je préfère travailler sur des projets avec des			X	

procédures clairement définies.				
Tant que je peux faire ce que j'aime, les notes et récompenses que je peux obtenir ne m'importent pas tant que ça.				R
J'aime étudier des sujets tellement prenant que j'en oublie tout le reste.	X			
Je suis très motivé(e) par la reconnaissance que je peux obtenir des autres.			X	
Je dois sentir que je suis récompensé(e) pour ce que je fais.			X	
J'aime essayer de résoudre des problèmes complexes.		X		
C'est important pour moi d'avoir un exutoire pour mon expression personnelle.	X			
Je veux découvrir à quel point je peux être bon(ne) dans mes études.	X			
Je veux que les autres découvrent à quel point je peux être bon(ne) dans mes études.			X	
Ce qui importe le plus pour moi est d'aimer ce que je fais.	X			

Motivation Scale adapted from Amabile et al's Work Preference Inventory (1994)

Notes:
- An X indicates the primary and secondary scales the item belongs to and a R indicates that it is reverse-coded
- Participants were explained that the propositions refer to global attitudes in higher education and were asked to indicate how much they identified with each of them on a 5 point Likert-scale: 1) Strongly disagree; 2) Disagree; 3) Not sure/don't know; 4) Agree; 5) Strongly agree

Appendix C

English version of the Interview guide

Introduction
- introduce myself
- purpose of the study
- explain reasons why they were selected: high perceived playfulness (and therefore, usefulness), convenience of access
- confidentiality and anonymity assurance
- warn that some questions might sound silly, no right and wrong answers
- explain they're free to interrupt, ask questions, criticise
- explain that the conversation is saved
- seek consent

What are your pastimes, hobbies? What are your favourite ones?
(How about active hobbies, those with a goal?)

How "playful" would you say you are in general? *Explain the notion*

What are the reasons that motivate you to pursue those hobbies/pastimes? What do you like about them? What do they provide you?

What is your field of study?

What are the reasons that motivated you to study ...? What do you like about this field ? What does it provide you?

Do you think there are common motivations in the choices you make about your hobbies and those you make about your education/career choices?

If so, what are those common motivations?
Probe with (a) active engagement; (b) personal interest, enjoyment, pleasure, happiness; (c) experimentation, innovation and creativity; (d) new experiences, challenge, achievement, self-efficacy; (e) social relationships; (f) reflection

Is there anything in particular you would like to add in relation to leisure and learning?

Thank you

French version of the Interview guide

Introduction:
- me présenter
- buts de l'étude
- expliquer pourquoi ils ont été sélectionnés: caractère joueur pressenti comme prononcé (et donc utilité), facilité d'accès
- promesse de confidentialité et d'anonymité

- prévenir que certaines questions peuvent sembler bête; ni bonne ni de mauvaise réponse
- expliquer qu'ils sont libres d'interrompre, de poser des questions, de critiquer
- expliquer que la conversation est sauvegardée
- demander l'accord

Quels sont tes passe-temps/loisirs ? Lesquels sont les plus importants ?
(Qu'en est-il des passe-temps actif, avec un but ?)

A quel point te considères-tu comme "joueur(se)" en général ? *Expliquer la notion*

Quelles sont les raisons qui te motivent à poursuivre ces loisirs ? Qu'est-ce que tu aimes en eux ? Qu'est-ce qu'ils t'apportent ?

Quel est ton domaine d'étude ?

Quelles sont les raisons qui t'ont motivées à étudier... ? Qu'est-ce que tu aimes dans ce domaine ? Qu'est-ce qu'il t'apporte ?

Est-ce que tu penses qu'il y a des motivations communes entre les choix que tu fais à propos de tes loisirs et de ceux que tu fais à propos de ton parcours éducatif/tes choix de carrière ?

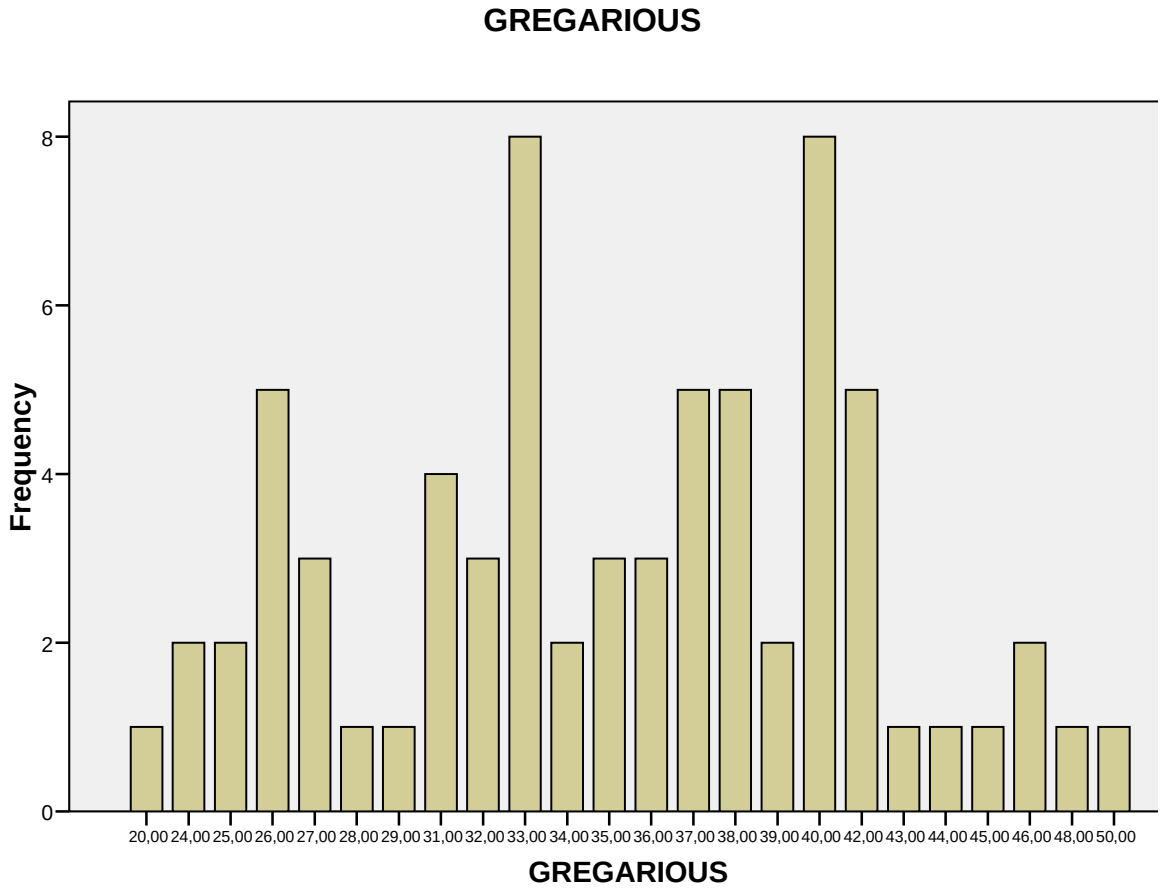
Si oui, quelles sont ces motivations communes ?
Sonder sur (a) engagement actif; (b) intérêt personnel, plaisir, bonheur; (c) expérimentation, innovation et créativité; (d) nouvelles expériences, challenge, réussite, compétence; (e) relations sociales; (f) réflexion

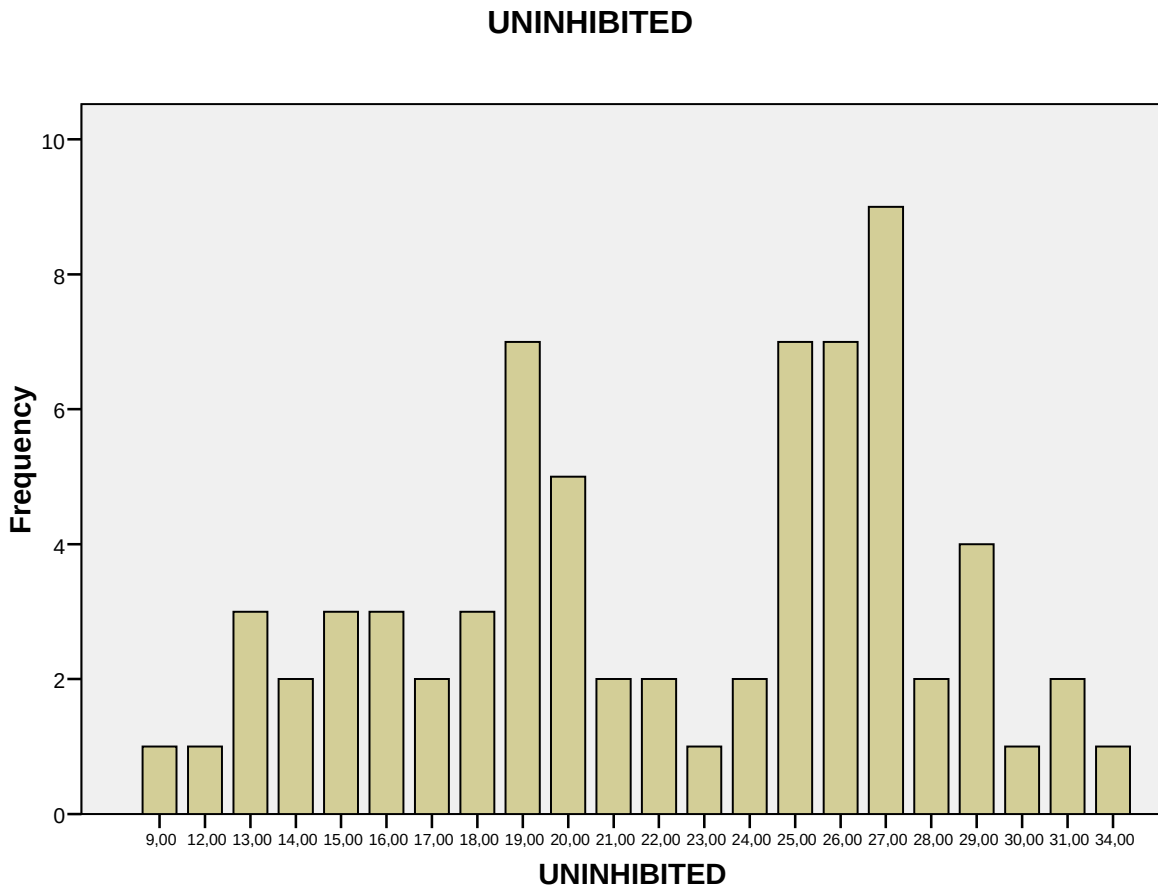
Y-a-t-il quelque chose en particulier que tu voudrais ajouter en lien avec tes loisirs et l'apprentissage ?

Merci

Appendix D

Distribution of the scores on the playfulness secondary scales

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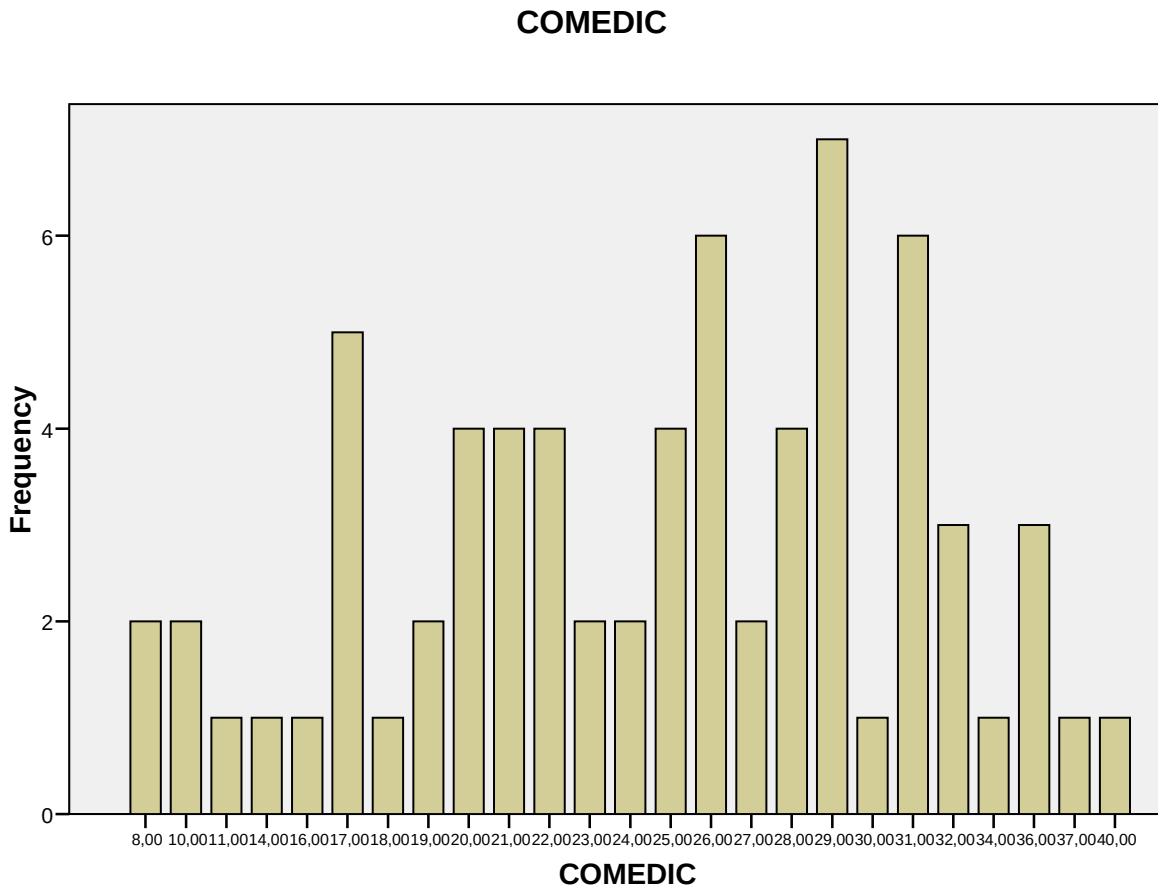
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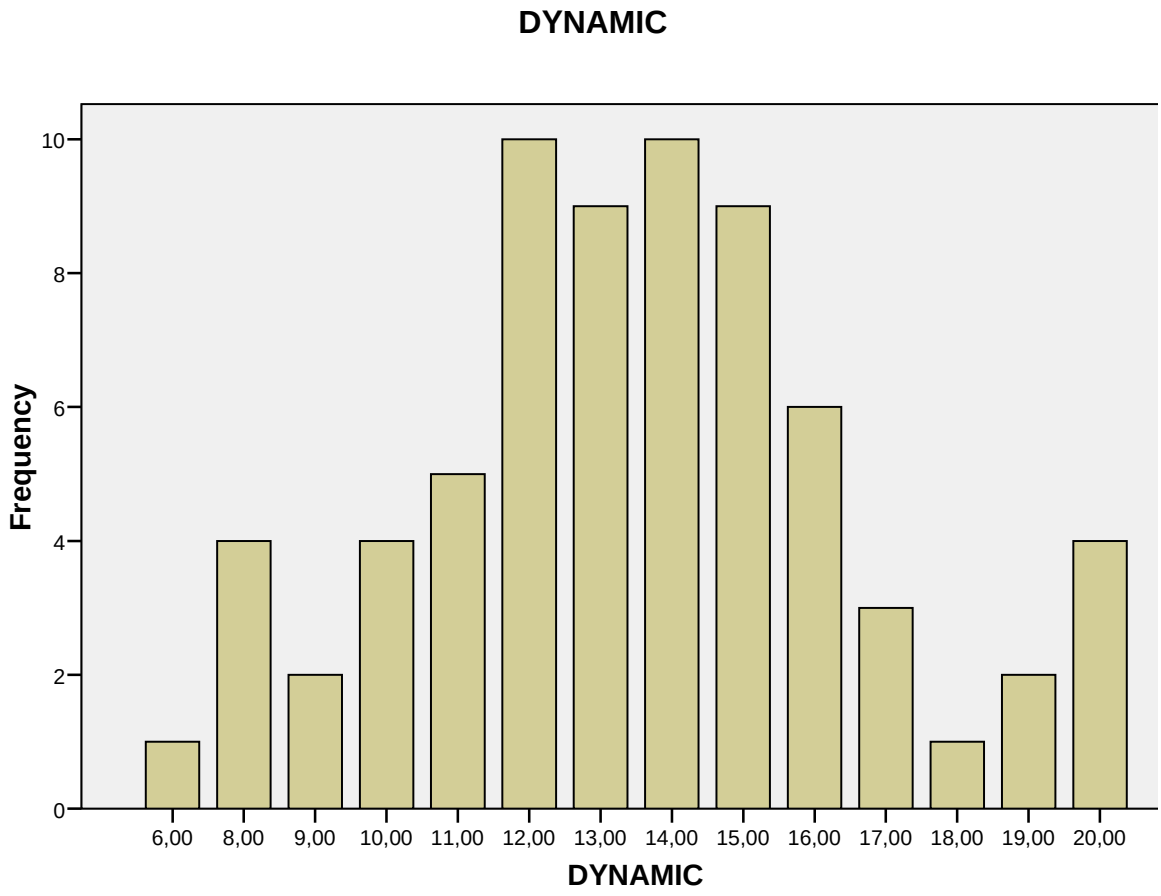
COMEDIC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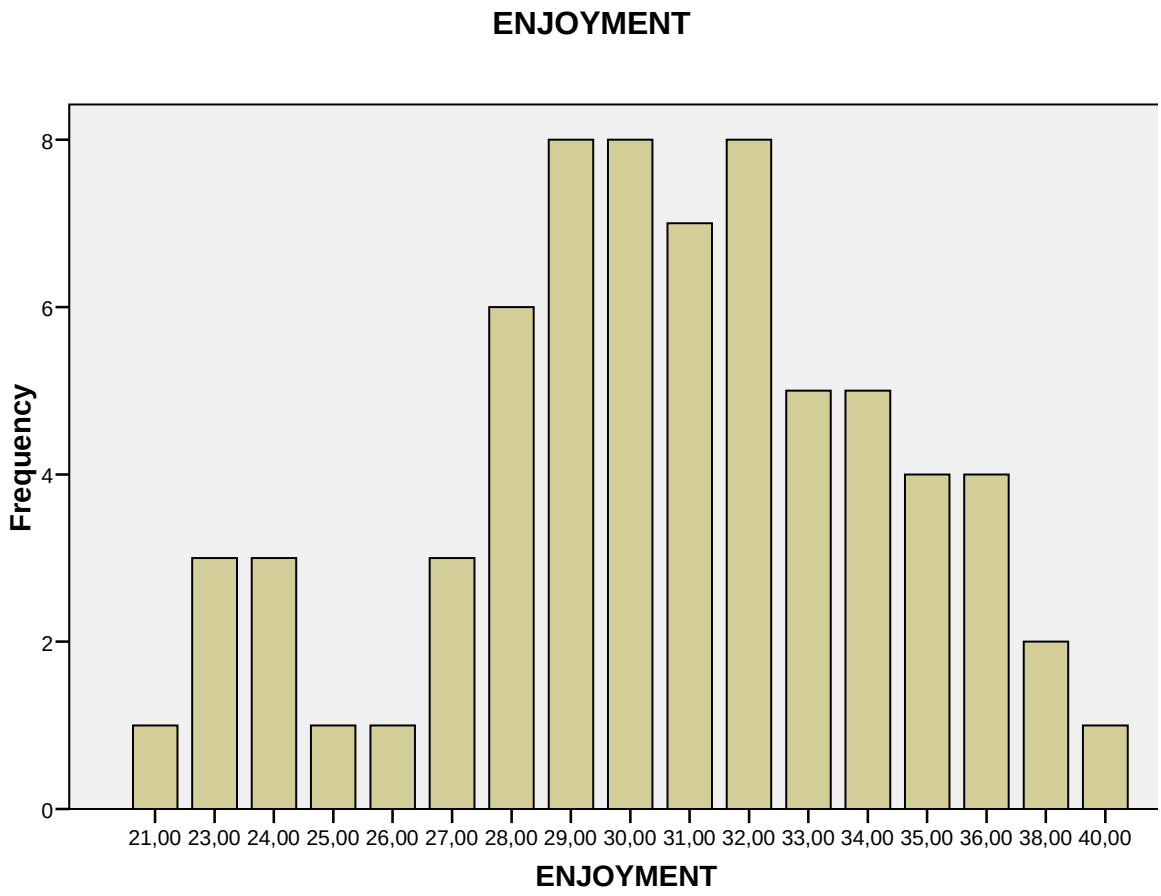
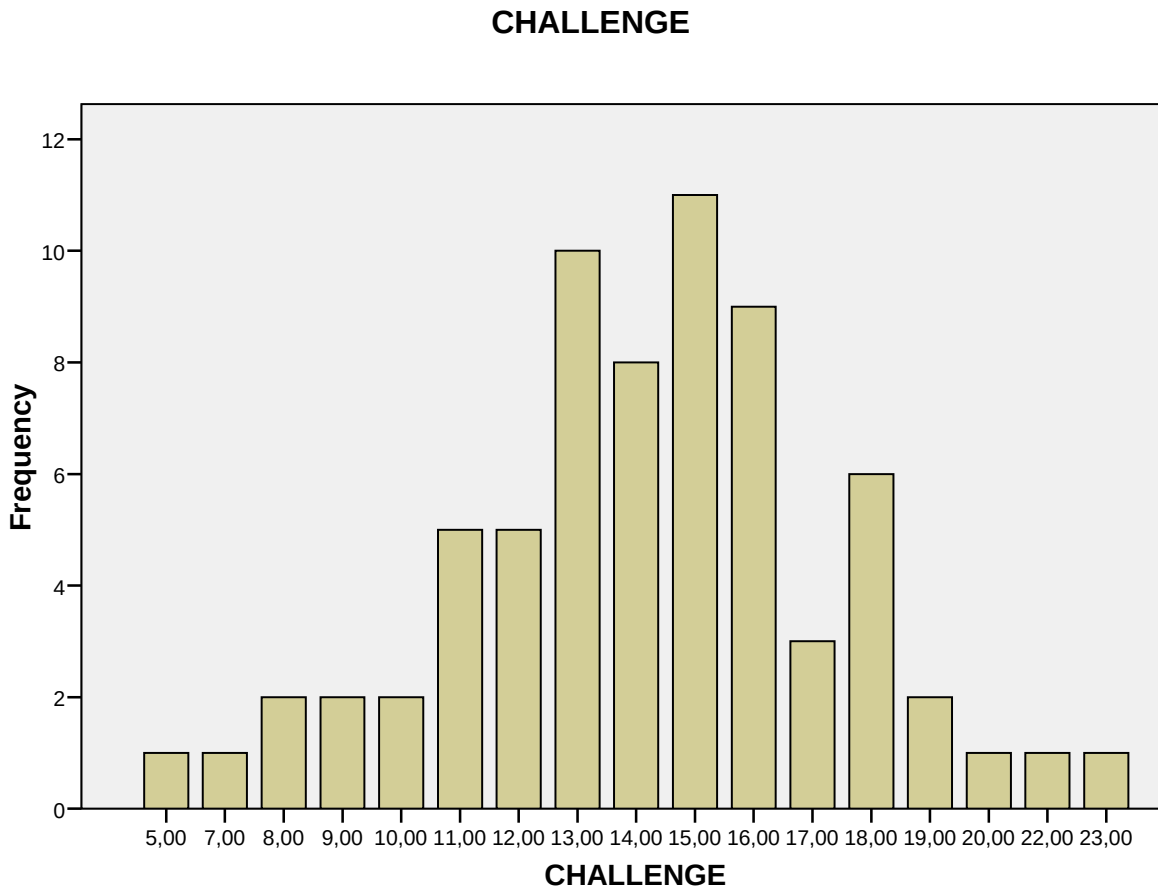
Distribution of the scores on the intrinsic motivation secondary scales

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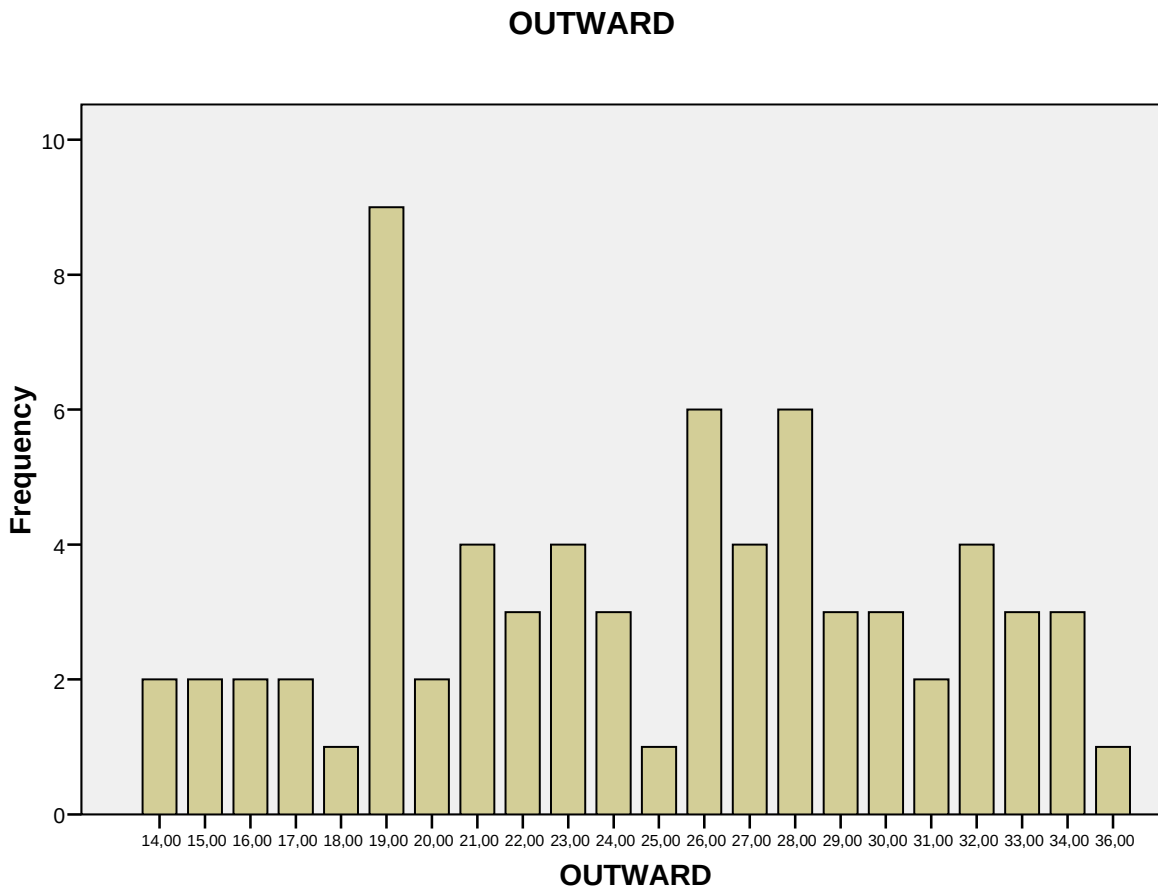
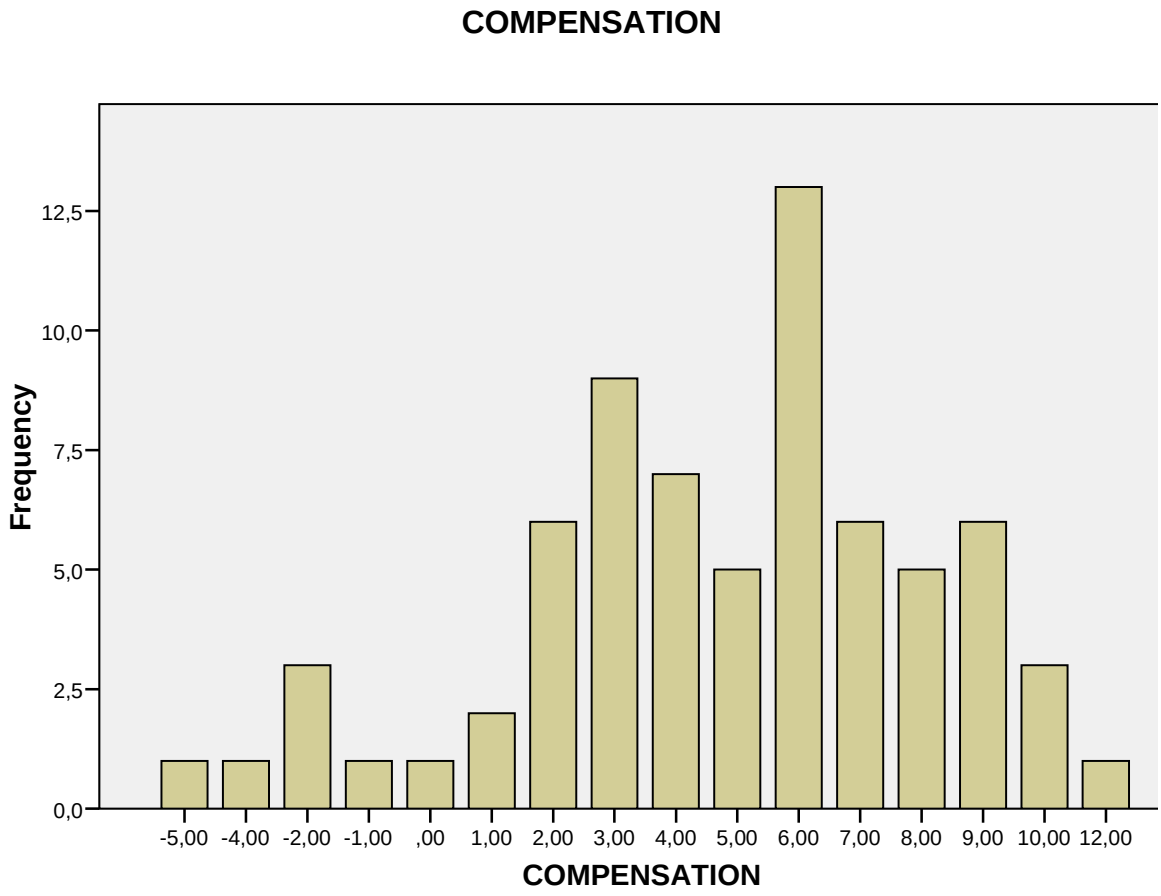
CHALLENGE

Distribution of the scores on the extrinsic motivation secondary scales

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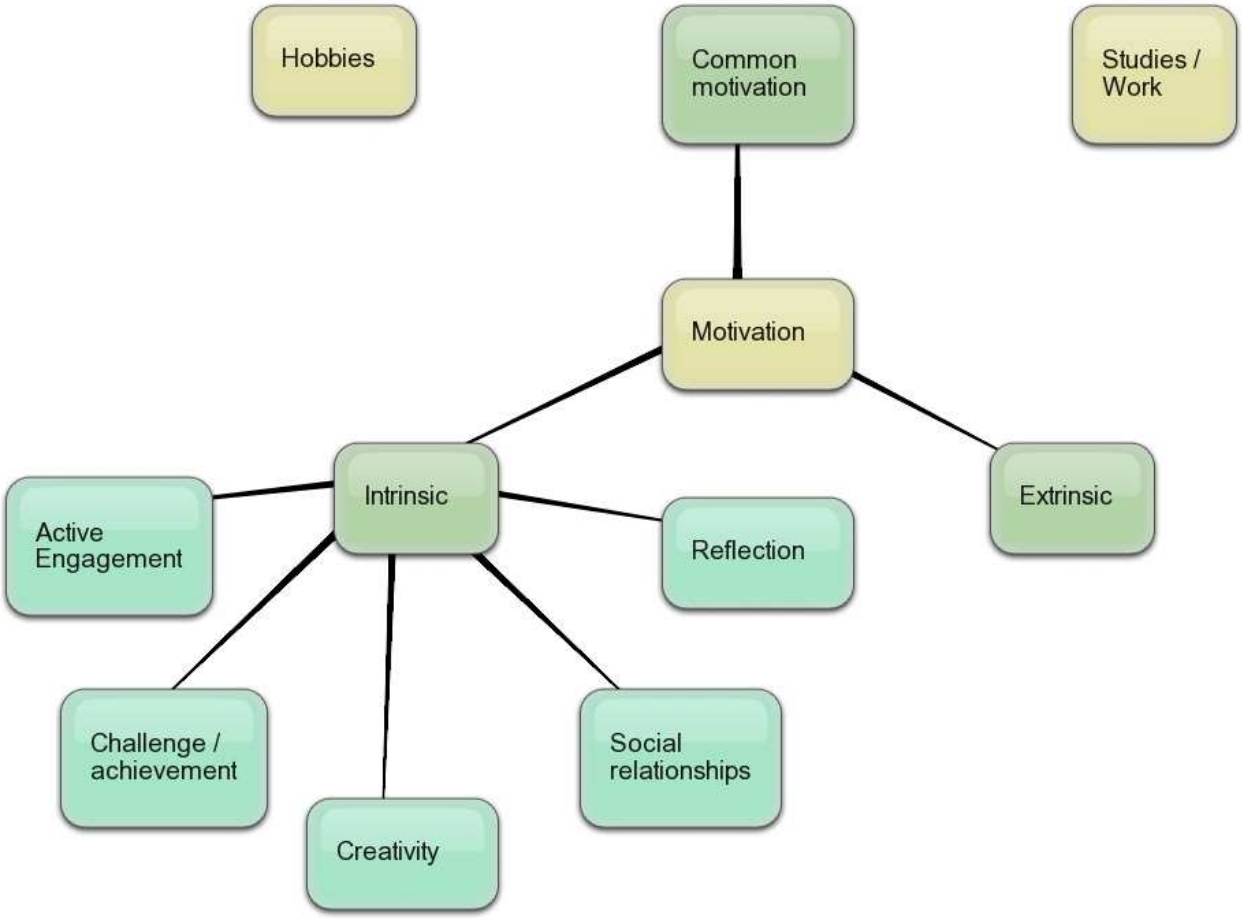
COMPENSATION

Appendix E

Categories used to analyse the interviews



Criteria for inclusion in the top-level categories

- **Hobbies**: information about interviewees' pastimes
- **Studies / Work**: information about interviewees' studies and/or job
- **Motivation**: information about interviewees' motivation to either play or learn/work (or both)
- **Common motivation**: motivation that is common to playing and learning for any given interviewee (added because of the limitations of HyperResearch's code analysis functions)

Other categories are self-explanatory and their criteria are obvious given the information for the *Motivation* category