

INVESTIGATING SOCIAL MOTIVATION IN AN EDUCATIONAL GAME FOR ACQUIRING INTERCULTURAL SKILLS

THESIS PROPOSAL

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ABSTRACT

Games are increasingly being adapted for use as educational tools. One relatively new use of games is to facilitate learning social or interpersonal skills such as conflict resolution by simulating human behavior with virtual characters. My work investigates students' social goals to understand how they help motivate students to acquire cultural understanding in BiLAT, one such system designed to teach cross-cultural negotiation skills.

In previous work, I hypothesized that students who were given explicit social goals (e.g., "Come to understand your partner's point of view") would be more successful in learning from the game than students who were given task-focused goals only. The results did not confirm our hypothesis – the group without the explicit (externally-imposed) social goal learned more according to most measures. However, on further investigation, students who reported having social goals in a manipulation check, regardless of whether they were externally imposed, seemed to learn the most. These results combined with my other preliminary work suggest that social goals and interactions are important in learning cultural negotiation, but that setting explicit social goals may not be the right scaffold.

In this proposal, I outline a program of research to understand the role of integrative and self-assertive social goals in learning cultural negotiation and how to promote them. First, I will implicitly manipulate students' goals in a culturally-situated game to determine how social goals affect learning. Second, I will develop a model of how social goals are influenced by and interact with learner characteristics such as social intelligence and personality traits. These two strands will result in the development of an in-game intervention that will implicitly scaffold social goals that are beneficial to learning intercultural competence. This work will contribute to the literature on learning sciences, virtual environments, and intercultural competence to provide a better understanding of how people interact socially with virtual humans in a cultural learning context.

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1. INTRODUCTION

Simulation-based instructional systems are increasingly being used to facilitate learning social or interpersonal skills such as conflict resolution by simulating human behavior with virtual characters (Raybourn & Waern, 2004). These skills are currently taught through methods like role-playing exercises and tutoring, both of which are very resource-intensive teaching methods (Landis, Bennett, & Bennett, 2003). Computer-based simulations, which are growing more realistic, offer a major advantage for social learning by providing a cheaper solution to a much larger number of students. Examples of existing game-based instructional systems with social learning components include FearNot (Hall et al., 2006), PeaceMaker (Burak, Keylor, & Sweeney, 2005), and BiLAT (Hill et al., 2006). BiLAT, the game in which I situate this work, is a virtual environment that supports cross-cultural interactions in the context of a negotiation task.

While results on learning from such simulations are preliminary, they are purported to be highly motivating (e.g., Lepper & Malone, 1987; Klein & Freitag, 1991; Parker & Lepper, 1992). Motivation is important in learning contexts because it can lead students to make greater effort, seek greater challenges, set higher goals, and have higher achievement (see Schunk, Pintrich, & Meece, 2007). However, there has been little research on how aspects of student motivation affect learning in social simulations, and even less on how they affect learning of intercultural competence in such environments. Since motivation is a very multi-faceted notion, it is important (both from a practical and a theoretical perspective) to better understand what aspects of student motivation are particularly conducive (or not conducive) to student learning in this context.

One standard framework of student motivation that is relevant to games which has been studied extensively within the realm of educational psychology is goal orientation. Goal orientation researchers tend to focus on mastery and performance orientation, or, the difference between striving to master the material versus to demonstrate high scores or top performance (e.g., Dweck & Leggett, 1988; Ames, 1992). Students bring these academic goals to the learning environment based on many personal factors (e.g., Dweck, 1999; Eccles & Midgley, 1989). However, in a domain like culture that focuses on social interactions, social factors might have an even greater influence on learning. Cultural interaction is an inherently social process between people with different cultural identities. While cultural identity may be largely unconscious, it becomes more salient when interacting with someone of another culture who is then categorized as a member of an “outgroup” (Prentice & Miller, 1999). Such cross-cultural contact can exacerbate ingroup-outgroup biases and lead to social goals like the desire to be seen as distinct from and positively compared to the outgroup (Taylor & Moghaddam, 1994). These motives, categorized as self-assertive social goals (Ford & Nichols, 1992), may be detrimental to learning about a new culture. On the other hand, integrative social goals, such as a need for affiliation or the desire to conform to social rules, may promote learning. I plan to study these goals in virtual learning environment to understand how to promote or increase social goals that may be beneficial, while decreasing social goals that interfere with learning.

In previous work, I hypothesized that students who were given explicit social goals (e.g., “Come to understand your partner’s point of view”) would be more successful in learning from the game than students who were given task-focused goals only. The results did not confirm my hypothesis – the group without the explicit (externally-imposed) social goal learned more according to most measures. However, on further investigation, students who reported having

social goals in a manipulation check, regardless of whether they were externally imposed, seemed to learn the most on task-specific and far transfer measures. These results combined with my other preliminary work suggest that social goals and interactions are important in learning cultural negotiation, but that setting explicit social goals may not be the right scaffold for students who do not generate these goals spontaneously. It is an open question how such goals can be promoted in a way that improves learning of intercultural competence in environments (such as BiLAT) in which learners interact with virtual characters from a different culture. Methods used for reducing outgroup bias in cross-cultural contact focus primarily on promoting cultural similarities (Gaertner, Dovidio, Anastasio, Bachman, & Rust, 1993), and often avoid direct consideration of cultural differences which seem critical to learning intercultural competence. To the best of my knowledge efforts to integrate these methods into advanced computer simulations have been limited or nonexistent.

In my dissertation work, I propose to 1) develop an intervention that can be built into a virtual learning environment to implicitly scaffold social goals, 2) manipulate students' social goals to better understand the nature of social motivation and how it leads to learning, and 3) develop a model of how social goals are influenced by and interact with learner characteristics such as need for affiliation (Baker, 1979), social intelligence (Silvera, Martinussen, & Dahl, 2001), and the five factor model of personality traits: openness, neuroticism, agreeableness, extraversion, and conscientiousness (McCrae & Costa, 1996). In doing so, I will also attempt to mitigate two factors that had a strong influence on the preliminary results: gender differences and extrinsic goals. My central hypothesis is that an intervention in a virtual learning environment designed to reduce outgroup bias while retaining cultural differentiation can promote both self-assertive and integrative social goals, which in turn will lead to greater cultural learning gains and more positive attitudes towards the target culture. My thesis will contribute to human-computer interaction by using user-centered design to develop improved ways to support intercultural learning through technology. It will contribute to the learning sciences by increasing our understanding of how social goals influence learning in the context of a cross-cultural negotiation task, and how they can be promoted in a way that is beneficial to learning. In the field of intercultural training, I expect to demonstrate first that a game based in a virtual learning environment can produce successful learning outcomes on cultural learning measures, and to determine what role social motivation plays in the training.

In the next section I review related work in intercultural competence, virtual learning environments, and student motivation. Section 3 describes my preliminary work in these areas including a think-aloud study, expert interviews, and a user study. In Section 4 I present the proposed work including an iterative design phase and subsequent user studies which will manipulate students' social goals. In the remaining sections I describe the anticipated contributions of this work and a proposed timeline for its completion.

2. BACKGROUND

2.1. CULTURE

The domain in which this proposal is situated is intercultural competence. Cultural understanding is an important consideration in many contexts, from language classrooms to business

negotiations or service abroad (Landis et al., 2003). To emphasize the importance of these higher-order skills, The American Council on the Teaching of Foreign Languages has set forth standards regarding what students should know and be able to do in *Standards for Foreign Language Learning in the 21st Century* (ACTFL, 1996). A significant number focus on cultural understanding, e.g.:

Standard 3.2: Students acquire information and recognize the distinctive viewpoints that are only available through the foreign language and its cultures.

Standard 4.2: Students demonstrate understanding of the concept of culture through comparisons of the cultures studied and their own.

The document stresses the importance of going beyond a simple dissemination of knowledge of cultural practices to developing activities that cause students to reflect and gain insight on native perspectives, opinions, and values. For example, the Cultura project (Furstenberg, 2001) found that “The word *individualisme/individualism*, is a prime example where highly positive connotations of words such as ‘freedom,’ ‘creativity,’ and ‘personal expression’ appear on the American side, while the French side is replete with such negative notions as ‘*égoïsme*,’ ‘*égocentrisme*,’ ‘*solitude*.” Students do not make absolute conclusions about cultural issues (nor does my work encourage them to develop one single interpretation of cultural phenomena), but rather use instructional materials to generate possible perspectives. The ability to notice, analyze, and perform appropriate behaviors based on these different perspectives is termed ‘intercultural competence’ (Kramsch, 1993).

In this work I focus on two of the main skills of intercultural competence, which have been described in Byram’s *savoirs* (1997). *Savoir-être* refers to the ability to approach intercultural learning with curiosity, openness and reflexivity. It is described as an affective capacity to relinquish ethnocentric attitudes towards and perceptions of otherness, and relates strongly to the quality of empathy. *Savoir-faire* indicates the ability to interact in culturally appropriate ways by making appropriate cultural explanations for behaviors. Practicing these skills differs from simply knowing a few facts about a culture (e.g., that the French standard criteria for completing high school is the Baccalauréat exam) in that students must be able to produce cultural behaviors and take into account multiple points of view. These skills are difficult to acquire, in part because people often instinctively interpret events from their home culture’s perspective, and much of their knowledge about culture is tacit. Bennett (1993) describes the DMIS model, including six stages through which people progress as they develop intercultural competence, and notes how rare it is to reach the final stage of complete competence. Methods of instruction that move students along these stages range from discussion to role-playing.

This proposal asks how virtual environments can better support the development of intercultural competence skills. Game-based virtual environments are well suited to give students practice by providing a necessary context in which to explore these skills. While negotiation is the context for gameplay in BiLAT, negotiation in a larger sense involves conducting meetings, setting up subsequent meetings, following up on promises, etc. My focus is on the cross-cultural issues that surround this negotiation. The aim is not simply to guide students towards obtaining the most lucrative negotiation outcomes, but rather to successfully build lasting relationships through cultural understanding. By rewarding students who take actions that conform to appropriate cultural behaviors, BiLAT addresses cultural concepts like polychronicity (differences in the

meaning of time), the value of social relationships and building trust, and face-saving, along with basic etiquette concepts like greetings, giving gifts, and leave-taking.

2.2. VIRTUAL ENVIRONMENTS AND VIRTUAL HUMANS

Over the last twenty years, as technology has become more pervasive in the classroom, a number of interactive virtual systems have been developed to address these skills. One of the earliest examples were text-based multi-user domains (MUDs), which allowed students to interact online in an imaginary world where they might use a foreign language and interact in culturally influenced ways (Bruckman, 1995, Falsetti & Schweitzer, 1995, etc.). More recently, other systems have leveraged modern video game and learning technologies to create highly immersive environments with virtual human characters that simulate intercultural communication. Croquelandia, a system intended for collaborative learning, is a virtual environment that lets users record actions with avatars to teach Spanish pragmatics (Sykes, Wendland, & Moore, 2008). The Tactical Language and Culture Training System provides a mission practice environment that allows learners to explore a virtual town while speaking to locals in Arabic, make culturally appropriate gestures, and accomplish goals such as getting the names of contacts and directions (Johnson, 2007). VECTOR situates learners in a virtual foreign town, but uses English utterances via menu selections for interaction with locals (Deaton et al., 2005). Finally, BiLAT is a serious game-based immersive learning environment that teaches the preparation, execution, and understanding of bilateral meetings in a cultural context (Hill et al., 2006). Described in more detail below, BiLAT is the context in which this proposal will be conducted. Most of these games are still in developmental stages and research efforts have focused on design and integration of interactive technologies rather than empirical evaluation of learning.

One way that such virtual environments may support social learning domains like intercultural competence is through their use of virtual humans. Virtual humans can be built with underlying models of culture, personality, and affect (e.g., Gratch & Marsella, 2001; Cassell, 1999). They can exhibit a wide range of emotions, and produce non-verbal social cues. But can students interact with such characters as they would while training with human role-players? According to a set of wide-ranging studies by Reeves and Nass (1996), people react to media like computers or televisions in fundamentally social ways. While widely accepted, these results are often demonstrated in restricted domains and with simple measures (e.g., Gratch et al., 2007, have demonstrated that virtual humans can evoke emotions or feelings of rapport). There have been several recent studies, however, that show that this phenomenon might be more nuanced than previously believed. Rosé and Torrey (2005) found that students displayed more productive learning behaviors when they believed there was a human driving the responses behind the instructional dialog system they were using. Additionally, Okita, Bailenson, and Schwartz (2008) found that students who believed there was a human behind an avatar in a virtual environment exhibited better learning, more attention, and higher arousal.

One explanation for this result is that learning is not an automatic process like emotion but requires attention and processing (Cohen, Ivry, & Keele, 1990). Students believe they are taking a socially relevant action when they interact with a human, and thus pay more attention and feel more accountable. Many researchers therefore focus on developing increasingly sophisticated social models to drive the behaviors of virtual characters in the hopes that greater realism will increase students' learning (Tomlinson, 2005). However, because there exists an innate human

tendency to construe interactions as social, the complementary research agenda that I follow is to investigate the behaviors of the learner to promote better social interactions with the characters and more learning.

2.2.1. BiLAT

The context we use for our investigation is BiLAT (Hill et al., 2006), a game-based simulation for practicing bilateral negotiations in a cross-cultural context. The BiLAT architecture is built on Unreal Engine 2.5 and integrates research technologies such as virtual human characters and intelligent tutoring support. BiLAT was designed to address learning objectives related to negotiation generally, as well as the specific cultural knowledge and skills that support more effective negotiations in a particular culture. One primary learning objective is considering the counterpart's interests in order to achieve “win-win” results. A series of scenarios presented to the student drive the game experience. The initial scenarios are set in an Iraqi town, and the student is put into the role of a U.S. Army officer tasked with meeting with members of the town in order to accomplish specific goals (see Fig. 1).

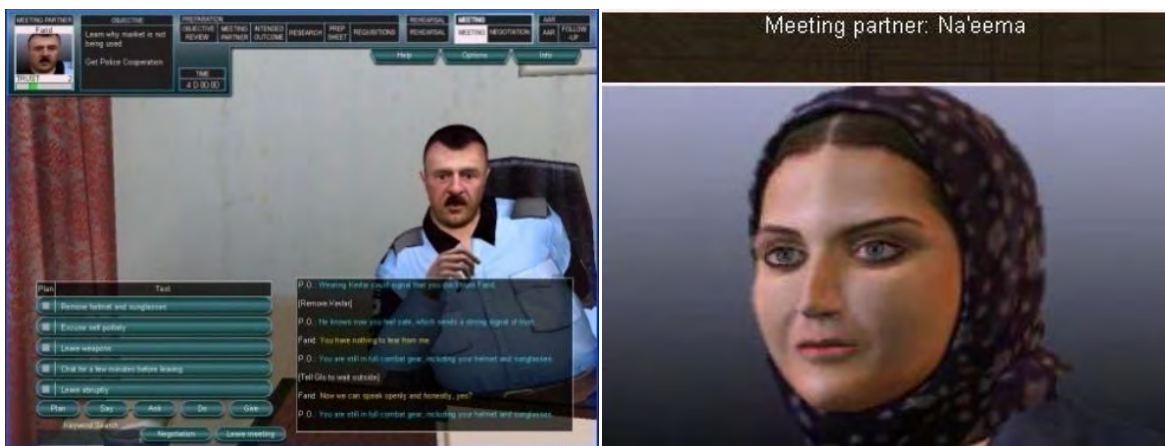


Fig 1. At left, a meeting in BiLAT with police captain Farid with the goal of solving a problem with a market in an Iraqi town. At right, meeting partner Na'eema, a doctor.

To play, the student begins by preparing for a meeting in the “prep room.” Here, the student learns about the character and the scenario from a number of different sources of varying degrees of trustworthiness. The student then moves into a meeting with a virtual Iraqi. The student communicates with BiLAT characters by selecting from a menu of hand-authored communicative actions. Underlying each virtual character is a social simulation with a model of culture and personality. Characters’ responses also depend on a number of factors, including the current meeting phase, his or her current level of trust in the student, and a virtual dice roll. The dice roll is intended to simulate uncertainty in human behavior – cognitive and emotional modeling techniques can be used to simulate these reactions in more principled ways (Hill et al., 2006). The character responds to the actions in both text and synthesized speech, as well as non-verbal behaviors such as gestures.

2.3. STUDENT MOTIVATION

While in layman’s definitions motivation often means increasing time on task or feelings of enjoyment, the educational psychology definition of motivation is a goal-directed process that

instigates or sustains behavior (Schunk et al. 2007). Virtual environments such as BiLAT are often given game elements such as proximal, task-related goals and explicit reward structures to motivate students, along with other “fun” additions like sound effects or animations (Reiber, 1996). While motivation has been studied using many theoretical frameworks, goal theory (Dweck & Leggett, 1988) may be most relevant to games. Two main goal orientations have emerged as the most studied. *Performance orientation* is the desire to achieve high grades or demonstrate successful performance outcomes. *Mastery orientation* is the desire to learn and understand the material. While these academic goals have been seen to influence learning, there is argument that other important goals exist in a learning context; social goals also deserve examination (Urdu, 1995; McCollum, 2006).

According to Ford and Nichol’s taxonomy (1992), there are two main categories of social goals: self-assertive and integrative social goals. The concept of identity is foremost in understanding these goal categories. *Self-assertive* goals relate to asserting one’s identity as an individual. This category subsumes goals such as the desire for superiority, self-determination, and individuality. *Integrative goals*, on the other hand, relate to a social identity, or one that is part of a larger community. This category subsumes goals such as affiliation, or the desire to build and maintain attachments, and social responsibility, or the desire to conform to social rules and avoid social transgressions. In the learning sciences, these goals have mostly been studied in the context of a classroom to determine how they correlate with broad measures of success (e.g., Wentzel, 1989; Patrick, 1997). For example, students who have a high GPA tend to hold more social goals, such as being responsible and seeking approval, than those with a low GPA, even while controlling for academic goals like mastery (Wentzel, 1991). This research tends not to focus on how particular social goals may differentially influence learning in specific domains.

Social goals have also been studied outside of learning contexts, however, in a way that might lead to successful interventions for learning purposes. Negotiation researchers have shown that having a sense of a shared group identity, as indicated by holding social goals such as the desire for affiliation, can increase positive attitudes, lead towards a win-win perspective, and even increase negotiation outcomes for both parties (Weingart, Bennett, & Brett, 1993; De Dreu, Weingart, & Kwon, 2000). This sense of shared identity has been implicitly manipulated by researchers prior to the negotiation through discussion of similarities between the participants. As mentioned in the introduction, social goals have also been manipulated to reduce outgroup bias in cross-cultural contact with successful results (Gaertner et al, 1993). This result may be particularly applicable to the intercultural skill of *savoir-être*, the ability to express positive attitudes and empathy towards another culture. While improvements in performance outcomes have been demonstrated in various related domains, these results have not been studied in relation to learning. Additionally, they tend to emphasize integrative goals, and specifically the minimization of differences between groups. Because understanding cultural differences is critical to the intercultural skill of *savoir-faire*, and because social goals may interact with existing academic goals, there is a need to study whether these results can be applied to a learning context.

In my proposed work, I examine in greater depth the open issues relating to social goals. I intend to bridge these two separate strands of research to study the influence of social goals on learning intercultural negotiation.

3. PRELIMINARY WORK

3.1. EXPLORATORY STUDY 1

To investigate students' motivations, I conducted an exploratory study using BiLAT involving think-alouds and interviews with students from diverse backgrounds. Each met with two virtual characters while engaging in a think-aloud protocol. Additionally, I began an investigation into students' social motivation through the *locus of control* construct. Locus of control (Rotter, 1966) is a construct in social learning theory that could give some insight into whether players viewed the virtual characters as having any agency in their learning. I explored the following questions: how do students interact with the game and the virtual characters, and how do students' beliefs about locus of control relate to success in this game?

3.1.1. LOCUS OF CONTROL

Locus of control describes whether the cause to which events are attributed is internal to the student (e.g., high ability) or external (e.g., a mean teacher). Students who attribute their performance to internal causes like amount of effort put forth tend to have better learning outcomes than those who attribute performance to external causes (Phares, 1976). These locus of control attributions also seem to be causal; a number of studies have shown that we can retrain students to make adaptive attributions, or those that lead to more learning (e.g., de Charms, 1976; Perry, Hechter, Menec, & Weinberg, 1993). Therefore, understanding people's locus of control attributions in games may ultimately lead to better educational game design.

In contrast to other domains, when learning skills that involve social interaction (such as cultural negotiation), it may be the case that not all external attributions exert equal influence on student learning. When negotiating with a counterpart in the real world, the outcome is most likely dependent on both parties. Realizing that one does not have full control, and that outcomes are *sometimes* due to factors not fully under one's control, may actually be an adaptive rather than a maladaptive pattern. While locus of control typically focuses only on whether a cause is internal or external, I introduced several individual external actors as possible loci: the virtual characters, the culture to which the characters belonged, and the game itself. I hypothesized that key differences from standard locus of control findings would be that successful students would give more credit for their performance to the virtual game characters or the Iraqi culture.

3.1.2. METHOD

The 13 participants ranged in age from 19 to 54 ($M = 34$). I recruited participants who varied in their frequency of game play on a 4-point scale (never, rarely, monthly, weekly; $M = 2.8$, $SD = 1.15$), as well as in their self-rating of negotiation skill on a 7-point scale ($M = 3.15$, $SD = 1.4$). Students took a demographics questionnaire, then watched an introductory video about concepts and skills related to the learning objectives of the game. Next, they entered the game and met with two different characters. Each negotiation with a character began in the "prep room" of the game where the student acquired information about the character and the current scenario from many different sources of varying degrees of trustworthiness (the student is not told beforehand who is trustworthy). The student then met with the character until an agreement was reached in the negotiation or the allotted time ran out. At this point students were given the locus of control

survey described below, and then moved along to the subsequent negotiation after which they completed a second survey. Throughout this process the students were prompted to think out loud using the protocol developed by Ericsson & Simon (1993). After the student met with both characters, he or she left the game and entered an open-ended interview with the experimenter. The session lasted approximately two and a half hours.

3.1.3. MEASURES

Following each negotiation with a character, students took a survey based on the Revised Causal Dimension Scale (McAuley, Duncan, & Russell, 1992), in which they rated their own performance at the task and wrote down the most salient cause for their performance. Then they rated this cause on a 9-point Likert scale according to the locus of control. Because I expanded the locus of control dimension to address individual external actors, students rated whether the cause of their performance was due to the game itself, the character with whom they had interacted, or the culture to which the character belonged.

3.1.4. VERBAL DATA RESULTS

From the think aloud data, I found that most students' verbal commentary during the game was highly focused on achieving the proximal task-related goals of the game, or on other game or interface elements. Students who identified themselves as frequent gamers were especially focused on these issues. There was, however, a subset of participants who mentioned concepts like *empathy*, *perspective*, or *rapport* with the characters when interviewed after they played, e.g., "I was trying to take his perspective, and put myself in Farid's shoes." These participants were less focused on task goals, tended to give the virtual characters more credit for the outcome, and be more successful at the game. The key insights I gained from the verbal data were that the task goals of the game seemed to be the most salient for the participants, perhaps distracting them from engaging with the virtual characters as social beings. This seemed to be related to less success in the game. It also seems likely that they would have learned less sophisticated skills of intercultural negotiation.

3.1.5. LOCUS OF CONTROL RESULTS

I measured success in the game by determining the number of negotiation objectives each student met in each negotiation. In the first of the two negotiations, I found that students' ratings of locus of control were significantly correlated to their success. Specifically, success was highly correlated to an internal locus of control ($r=.659$, $p=.014$) and negatively correlated to blaming BiLAT ($r=-.581$, $p=.037$). An independent-samples t-test showed that there were significant differences in ratings between genders in this negotiation. Women were more likely to attribute their performance to the game ($M=7.00$, $SD=.86$) than men ($M=4.56$, $SD=2.00$); $t(11)=-2.31$, $p=.042$. They were marginally less successful than men at achieving the objectives in the game ($M=.13$, $SD=.25$; $M=.67$, $SD=.5$; $t(11)=2.02$, $p=.068$).

In the second negotiation, performance dropped significantly ($M=.54, SD=.49; M=.25, SD=.45; F(1,11)=5.04, p=.046$), as did students' rating of their own performance on a 7-point Likert

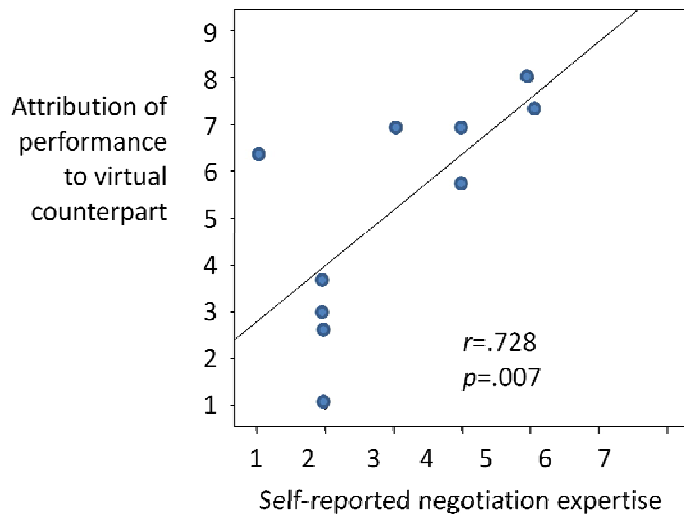


Fig. 2: Attributions towards virtual counterpart by negotiation expertise, second negotiation

scale ($M=5.15, SD=1.77; M=3.58, SD=1.93; F(1,11)=4.91, p=.049$). In this negotiation, gender no longer had any effect on attributions along any dimension (all r values $< .2$). However, significant correlations between locus of control ratings and prior knowledge did appear. Students with more negotiation expertise were more likely to attribute their performance to the character in the game ($r=.728, p=.007$, see Fig. 2) and the culture ($r=.596, p=.041$), and less likely to attribute their performance to internal factors ($r=-.775, p=.003$). However, self-rating of 'knowledge of Arab cultures' was not significantly related to locus of control.

3.1.6. DISCUSSION

In the first negotiation, typical relations emerged between performance and locus of control. Success was linked with feeling like one is personally responsible, and negatively correlated to feeling like the environment is responsible for one's performance. I also found that females may have had difficulty in adjusting to the environment – they were slightly less successful, and blamed the game instead of themselves. This is congruent to findings by some researchers that females tend to have maladaptive patterns of attributions (see Dweck, Davidson, Nelson, & Enna, 1978, or Eccles, 1983, for a discussion). This pattern may be detrimental to females' self-efficacy and to their persistence in continuing with the game (Schunk et al., 2007).

By the second negotiation, however, the task became more difficult for everyone. The character in the game was more difficult to negotiate with, and performance dropped. When this happened, it appeared that some prior knowledge factors became predictive of locus of control patterns. Students with more negotiation expertise were more likely to share responsibility with the character they were engaging with, as well as the culture. This may indicate that these students were engaging in a schema of social interaction from their prior experience, as I hypothesized. In fact, prior knowledge of a domain has been thought to influence attributions (Fiske & Taylor, 1991). However, self-rating of knowledge of Arab cultures did not correlate to attributions in the same way. Among possible explanations is that *knowledge of a culture* does not always translate to skill in *interacting with* that culture.

3.2. EXPERT INTERVIEWS

Following this exploratory study, I conducted individual interviews with three Army captains who had been recommended as successful negotiators in an Iraqi cultural context. All three participants were captains who had been deployed several times, each spending over two years

abroad. None had negotiation training before they were deployed, but each felt that they did not have trouble adjusting to the environment when they arrived. In general, they believed that the abilities required to perform this job are either innate (you are personable or you are not), or they require a few general skills such as showing respect. They believed that success was also dependent on being able to constantly reevaluate the current situation and take into consideration both the meeting partner and the external circumstances. However, while on the job, each captain had developed a particular way of opening meetings and conducting a social meeting phase that they felt was repeatedly successful. When I introduced them individually to BiLAT, every participant had difficulty accomplishing goals in the game. They each claimed this was due to the unavailability in the game of their preferred methods of developing social relationships. An additional finding was that while they had successfully accomplished negotiation tasks in Iraq, they did not tend to have favorable opinions about Iraqis:

Participant 3: “They’re extremely hypocritical. A lot of the Iraqi men are. But they don’t want to lose face. So they want to look good and they want to say the right things and do the right things around those they think are watching or care but the reality of the situation might be something very different.”

The main points to take away from these interviews were:

- A focus on social interaction is important
- There is a need for flexible or adaptable thinking in social interactions
- Negotiation skill and positive cultural opinions or attitudes do not always coincide

3.3. STUDY 2

Based on these insights gained from the prior studies, and the results from the literature regarding the potential impact of social goals in intercultural competence, I conducted an experiment to investigate whether being presented with a social goal in addition to task goals in the game would increase students’ learning of cultural concepts. The manipulation I introduced was designed to be extremely simple; students were simply presented with a social goal on the game screen that listed their objectives.

3.3.1. METHOD

Participants were 59 students, mostly undergraduates, recruited from two institutions. They were compensated \$40 for a two and a half hour session. In the between-subjects design, students were randomly placed into one of two conditions. The control condition played BiLAT with its standard negotiation task goals. The experimental condition received an additional goal presented on the objectives screen for each meeting, labeled “Come to understand your partner’s point of view.” Although only the experimental condition received this explicit goal in the game, all students were told in the introductory video that it was an important consideration. The study proceeded as described in the method of Study 1 (section 3.1.2), with the addition of several assessments of knowledge described below.

3.3.2. MEASURES

Assessment of intercultural competence is not a trivial task. It is an ill-defined domain; there is not always a clear distinction between right and wrong answers, and even experts at times may

disagree. A number of measures have been developed that may be used in different situations. I chose to assess the cultural and negotiation learning objectives with a Situational Judgment Test. This assessment is used in ill-defined domains and asks students to rate the appropriateness of various actions based on situations related to the learning objectives (Legree & Pstotka, 2006). While this test has been used previously to collect data with students playing BiLAT, I do not report on the results here due to ceiling effects reached with the training video. As a measure of transfer, I introduced a selection of questions from the Cultural Assimilator (Cushner & Brislin, 1995). In this assessment, students read a scenario about people experiencing a foreign culture and chose the best of four possible cultural explanations for the events in the scenario.

Additionally, the students were administered a learning assessment related to the specific scenario and characters. Prior to and after meeting a new character, I asked students to rate the truth of various information items relating to the task or to the character. These items were taken from the information students received in the “prep room”. Students evaluated the items as true, false, or “I don’t know”. The goal of this measure was to assess a student’s ability to develop an accurate model of the character and the scenario. A successful student would be able to elicit information while meeting with the character and integrate this knowledge with the information from the sources in the prep room. I called this measure “information integration”.

Finally, I wanted to determine whether our manipulation had the desired effect on students’ goals in the game. I therefore asked them to list their goals in free text after meeting with a character.

3.3.2.1. LEARNING RESULTS

While 59 participants completed the study, I dropped 5 students from the analyses due to computer error or lack of attention or engagement in the task. To evaluate the success of our conditions, I coded students’ responses to the manipulation check into two categories, “no reported social goals” and “reported social goals”. Table 1 has the results of this coding broken down by gender. A chi squared test determined that the number of students with reported social goals was significantly influenced by condition ($\chi^2 (1, N = 54) = 5.868, p = .015$). Because so many students did not report their goals as expected, I examined all of the learning results in this light. In addition, considering the results from the previous study, I examined the hypothesis that gender might be related to learning outcomes. Research indicates that there may in fact be gender differences in social behaviors, social roles, or social focus (Hoffman, 1987; Hall, 1984).

Condition			Reported goals		
			Task	Social	Total
Control	Gender	Male	9	2	11
		Female	11	7	18
	Total	Total	20	9	29
Experimental	Gender	Male	6	10	16
		Female	3	6	9
	Total	Total	9	16	25

Table 1: Number of students by condition, gender, and reported goals

On the information integration items, students were given a point for each item that matched a subject matter expert’s rating of the information. I performed a repeated measures ANCOVA on students’ pre and post scores on the information integration items, with condition and gender as between-subjects variables and social goals as a covariate. Condition significantly influenced learning ($F(1,49)=5.307, p=.026$), as did gender ($F(1,49)=4.805, p=.033$); see Figure 3.

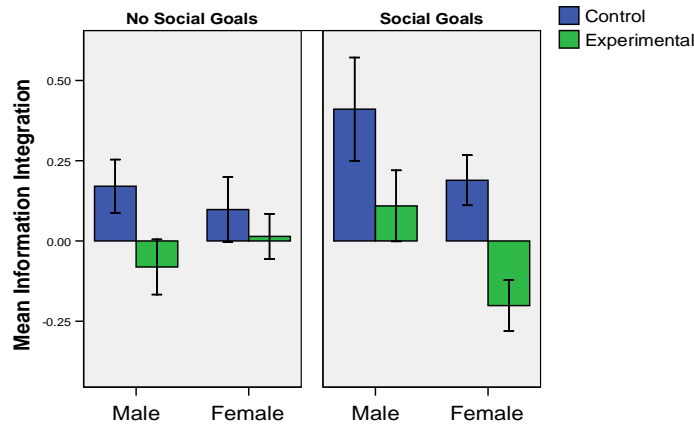


Fig. 3: Mean information gain scores by gender, condition, and social goals

I then divided the information integration items into social items, such as “Farid is a family man and is good with children,” and task-related items, such as “The U.S. must set up checkpoints to increase security in the market.” A repeated measures ANCOVA on the social items showed that gender significantly influenced learning ($F(1,49)=6.169, p=.016$), while social goals ($F(1,49)=3.979, p=.052$) and condition ($F(1,49)=3.285, p=.076$) marginally influence learning. The control condition outperformed the experimental condition, males outperformed females, and social goals outperformed no social goals. There was also a significant interaction between condition and gender ($F(1,49)=4.240, p=.045$). On this measure there was significant overall learning from pre to post ($F(1,49)=9.213, p=.004$). On task items, a repeated measures ANCOVA showed only that there is a marginal interaction between gender and condition ($F(1,49)=3.224, p=.079$). There was also significant overall learning from pre to post ($F(1,49)=13.552, p=.001$). See Figure 4 for gain means.

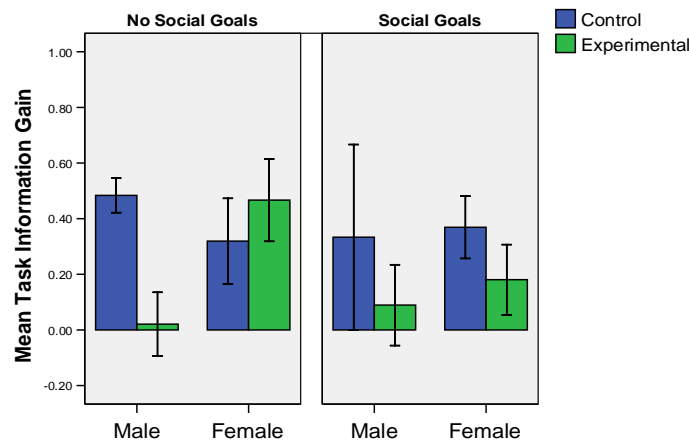


Fig. 4: Mean task information gain scores by gender, condition, and social goals

On these information integration items, it was possible to respond with “I don’t know”. A repeated measures ANOVA on students’ pre and post responses of “I don’t know” showed that gender significantly affected “I don’t know” responses ($F(1,49)=8.690, p=.005$), as well as condition ($F(1,49)=9.595, p=.003$). There was also a significant interaction between condition and gender ($F(1,49)=13.429, p=.001$). While female students in the experimental condition reported very high gains from pre to post of “I don’t know” ($M=3.33$), the other students reported a decrease ($M= -.44$).

Finally, a repeated measures ANCOVA on students’ pre and post scores on the culture assimilator transfer test showed that condition significantly influenced student learning ($F(1,47)=11.873, p=.001$), as did reported social goals ($F(1,47)=8.314, p=.006$). The control condition outperformed the experimental, and reported social goals outperformed no reported social goals. Also, there was significant overall learning ($F(1,47)=4.582, p=.038$).

3.3.2.2. GAMEPLAY RESULTS

I also compared students’ actions taken in the game using t-tests. Students who reported social goals ($M=79, SD=27$) took significantly fewer total actions than students who did not report social goals ($M=107, SD=49; t(52)=2.45, p=.018$). Broken down by action category, these students took significantly fewer business actions ($M=29.6, SD=12.6; M=40, SD=16.1; t(52)=2.60, p=.012$). Because actions could be repeated in the game, I additionally assessed the number of unique actions each student took. Students with reported social goals took significantly fewer unique actions ($M=37, SD=7.1; M=43, SD=8.6; t(52)=2.24, p=.029$). However, although time on task was not controlled, there were no significant differences between groups in the amount of time the game was played ($M=47.0, SD=13.6; M=46.2, SD=10.3; t(52)=.23, p=.8$).

3.3.3. DISCUSSION

The results did not directly confirm our hypothesis – being given explicit social goals seemed to be fairly detrimental across most measures, particularly if students were not inclined to achieve these goals. Unexpectedly, however, two other general patterns emerged across the conditions which help to explain the results. In most measures, males emerged as more successful. While the control group overall became more certain about the potentially conflicting information they were asked to evaluate, females in the experimental group became much more uncertain about what was true or false. In the next section I present several hypotheses for why I have observed this continuing overall trend of gender differences. Secondly, students who acknowledged or self-generated social goals were more likely to succeed. Only two thirds of the experimental group acknowledged social goals – even though they were explicitly given a social goal as a game task – while one third of the students in the control condition self-generated social goals. These students who reported social goals learned more on the culture assimilator and on the information integration items. These students also showed different patterns of gameplay. While they spent an identical amount of time in the game, they took fewer actions, which may indicate that they spent more time reflecting on each action. Additionally, they took fewer unique actions, signifying less exploration of the conversation space (perhaps avoiding dialog actions that could potentially be seen as offensive). Together, these patterns seem to present a social view of gameplay, where students build a theory of mind about their virtual partner, rather than a risk-free, task-oriented environment for discovery. These subgroups provide suggestive evidence that

social goals and interactions are linked to learning cultural negotiation, although the results show that such a simple, explicit manipulation was not the most effective means of integrating social considerations into the learning environment.

4. PROPOSED WORK

The goals of my proposed work are to 1) develop an intervention that can be built into a virtual learning environment to implicitly scaffold social goals, 2) manipulate students' social goals to better understand the nature of such goals and how they lead to learning, and 3) develop a model of how social goals interact with learner characteristics to influence learning. I will iteratively develop an intervention designed to induce the two categories of social goals, self-assertive and integrative goals, which I hypothesize will differentially affect learning. In the course of designing the intervention, I will address two problematic issues that arose from the previous work: gender differences, and extrinsic motivation. Using this intervention, I will experimentally manipulate the type of social goals students hold and assess their learning.

In conjunction with these experimental manipulations, I will focus on teasing apart which students are predisposed to accept or produce social goals. In the previously studied population, having social goals was not significantly related to most of the demographic characteristics I measured: age, negotiating experience, knowledge of Arab cultures, or frequency of playing games. Also, the social goal students did not have higher pre-test scores; they did not appear to be the higher ability students. I will collect other measures that may better predict which students will acknowledge or produce social goals, and which students have a higher aptitude for learning the intercultural skills.

4.1. DESIGN PHASE

4.1.1.1. INTRINSIC VS. EXTRINSIC MOTIVATION

In the previous study, it was a reasonable conjecture that if students would benefit from social goals, they should be presented with those goals in the game interface. While having social goals did appear to be good (especially for males), it was not sufficient to present them in the list of game goals. One strong hypothesis is that the detrimental effect was due to extrinsic motivational effects. This is supported by some research that shows that when extrinsic motivations or rewards are salient, motivation can decrease, especially if one previously had an intrinsic desire to achieve a similar goal (Deci, Koestner, & Ryan, 1999; Lepper & Henderlong, 2000).

Therefore the proposed study will instead manipulate social goals through the induction of implicit goals. The priming of implicit, or unconscious, goals has been studied in other contexts (e.g., Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001; Moskowitz, Gollwitzer, Wasel, & Schaal, 1999) and has been accomplished by various methods. For example, participants may be given word lists that contain semantically related concepts for the desired goals as part of an ostensibly unrelated memorization task before the main experiment (Rasinski, Visser, Zagatsky, & Rickett, 2005). Or, they may be given contextual cues, such as sounds or visual images that are associated with the goals, which can significantly change subsequent behavior (Bargh, Chen, & Burrows, 1996). In this proposed study, I will design a scaffold for a discussion imbedded in the game that primes students to focus on social goals.

4.1.2. GOAL INTERVENTION

Based on prior work studying groups and interactions among humans, I will develop an intervention that will be imbedded in the game. In the previously mentioned studies on improving performance in negotiation and cultural contact, the emphasis in the intervention was on discussing similarities. In teamwork research, one classic assumption sees diversity as a problem, especially where it introduces inter-group rivalries. In some studies diversity has been associated with negative outcomes such as performance reduction (Campion, Medsker & Higgs, 1993), ineffective communication, and reduction in cohesion (Jackson, Joshi & Erhardt, 2003; Ely & Thomas, 2001). But in a cultural context, diversity is important. Although the theory has not been empirically tested, there is a general consensus in intercultural training literature that teaching should include a discussion of both similarities (or universalities) and differences between cultures (Landis et al., 2003). And in fact, individuality has been found in other research to enhance group performance (Magjuka & Baldwin, 1991; van Knippenberg & Haslam, 2003); individuals are seen as having unique contributions to the group.

One study that investigated diversity in teams brought together athletes from various individual sports (Brooke, Postmes, Jetten, & Dyson, in preparation). They were instructed to develop a plan to promote themselves as either a group of similar athletes, a group of similar athletes with unique and different characteristics, or as unique individual athletes, in order to implicitly prime a sense of either a shared social identity or an individual identity. The two groups who discussed a social identity later outperformed the individual identity athletes on an individual physical task. These results can be attributed to social goals such as accountability, in which participants felt responsible to the group even for their individual performance; performance scores were significantly mediated by feelings of group identification.

Using this study as inspiration, here I propose an initial design for an intervention and four possible goal conditions. The content, instructions, and interface will go through a rapid prototyping design phase prior to deployment to ensure that students perceive different goals in different conditions. In this intervention, students will go into a room in the virtual environment and spend five minutes in a discussion with a game character. In this room the negotiation context will be stripped away, but the interface for taking actions and receiving feedback from the virtual character will remain the same. Each condition will view the same interface, but both the instructions and the content of the interaction will differ. In the three experimental conditions, the instructions will indicate that the purpose of the intervention is to get to know an Iraqi character better. The actions available to the student will allow them either to discuss similarities across the two cultures as well as the differences, or only similarities, or only differences. In the control condition, students will be instructed that the intervention will help them get comfortable with the interface; they will meet with the character and practice taking actions and viewing the responses. The topic in this condition will be neutral and not intended to engage them in an emotional or social interaction. Following the intervention all students will be taken back to the main menu where they will resume the game as in the previous studies.

4.1.2.1. GENDER

In previous studies I saw disparities in outcomes arise across genders. While this is an important issue, because it is not my central thesis I will not incorporate manipulations into the proposed studies to study why these differences occur. Instead, I will measure two factors that may have

caused these differences, and I will also make several modifications to the game which may reduce or mitigate them. I list several possible issues why disparities across genders may have emerged in the results, and what I will do to correct or measure them:

- *Iraqi culture*. It may be the case that women feel less comfortable interacting in an Iraqi cultural situation, where gender roles are stronger than in American culture. I will assess attitudes towards the culture and compare across genders.
- *Differences in gameplay*. It may be the case that women are less frequent game players or do not play games situated in virtual environments. While there is considerable dissention in the literature, some results that show women tend to be less comfortable operating in computer or video game environments may be relevant (Hoeft, Watson, Kesler, Bettinger, & Reis, 2008; Williams, Ogletree, Woodburn, & Raffeld, 1993). I will measure the frequency and types of games that student play to correlate with learning and differences in gameplay patterns.
- *Gender and identity*. Both of the virtual characters that students interacted with in the previous studies were male. To mitigate any differences there may be in how students interact with members of the opposite sex, I will change the gender of one of the virtual characters to be female. Additionally, while the gender of the player is currently unspecified, I will insert a dialog that explicitly allows the player to choose a female or a male identity in the game.

4.2. STUDY 3A

Using the intervention developed in the design phase, the goal of this study will be to experimentally manipulate students' social goals to investigate their effects on learning, while collecting information on learner characteristics. This study will focus on the two conditions expected to produce the most disparate results: the similarities plus differences discussion, and the neutral discussion.

4.2.1. METHOD

The study will begin with learner characteristic surveys taken online prior to arriving at the study location. Then, similar to Study 2, students will watch an introductory video about the concepts and skills related to the game's learning objectives. The students will then take a number of pretests (described below). At this point they will enter the game and begin the goal intervention, with content and instructions varied by condition. After the intervention they will take a goals assessment survey. Next, they will go through the prep room, take the information integration measures, and meet with two different characters. The student will meet with each character until an agreement on the negotiation is reached, and then retake the goals assessment. If the student does not come to a negotiation agreement when the allotted time runs out, the experimenter will move the student along. After the student meets with both characters, he or she will close the game and take the posttests.

4.2.2. MEASURES

Prior to arriving at the lab, participants will fill out a learner characteristics survey online. In addition to demographic information about prior experience with games, negotiation, and foreign cultures, they will take a short form of the five factor model personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism; McCrae & Costa, 1996). These variables are antecedents which have been hypothesized to influence intercultural competence (Abbe, Gulick, & Herman, 2008). I will also include the Tromso Social Intelligence Scale (Silvera et al., 2001); I believe social intelligence may be a factor that influences cultural learning or the expression of social goals.

I will assess students' goals using a short form of the Social Goals Questionnaire (McCollum, 2006) focusing on *belongingness* and *social responsibility*. I will assess students' self-assertive goals using a short form of the Aspects of Identity Questionnaire (Cheek & Tropp, 2002). Performance and mastery goals will be assessed using Button, Mathieu, & Zajac's Goal Orientation Scale (1996). Additionally, I will include a measure of entativity which assesses 'groupness', or how much the student feels like she and the virtual character form one entity in the negotiation (Leach et al., 2008).

I will assess learning through several measures from previous experiments. The Culture Assimilator (Cushner & Brislin, 1995) and the information integration measure, as described in section 3.3.2, will assess learning of the cultural knowledge components. Because the Situational Judgment Test (Legree & Psotka, 2006) was not discriminatory for learning in my population, I will investigate and pilot other assessments of *savoir-faire*, the ability to perform culturally-appropriate behaviors. I will also introduce a projective attitudes survey to assess *savoir-être*, specifically attitudes towards Arab cultures.

4.2.3. EXPECTED RESULTS

I plan to examine the results by developing path models that examine the relationships between learner characteristics, intervention type, social goals, and learning outcomes. Figure 5 shows a model of how the interventions might lead to the measured outcomes, as mediated by three categories of social goals.

In both the control and experimental conditions, students will arrive with pre-existing goals which may lead them on a path to learning. In particular, performance goals, or a desire to achieve high marks and demonstrate ability, may lead students to focus on the task and learn more about the particular scenario in order to show high performance in the game. Mastery goals, a desire to understand and master learning material, should lead students to acquire more general cultural learning objectives.

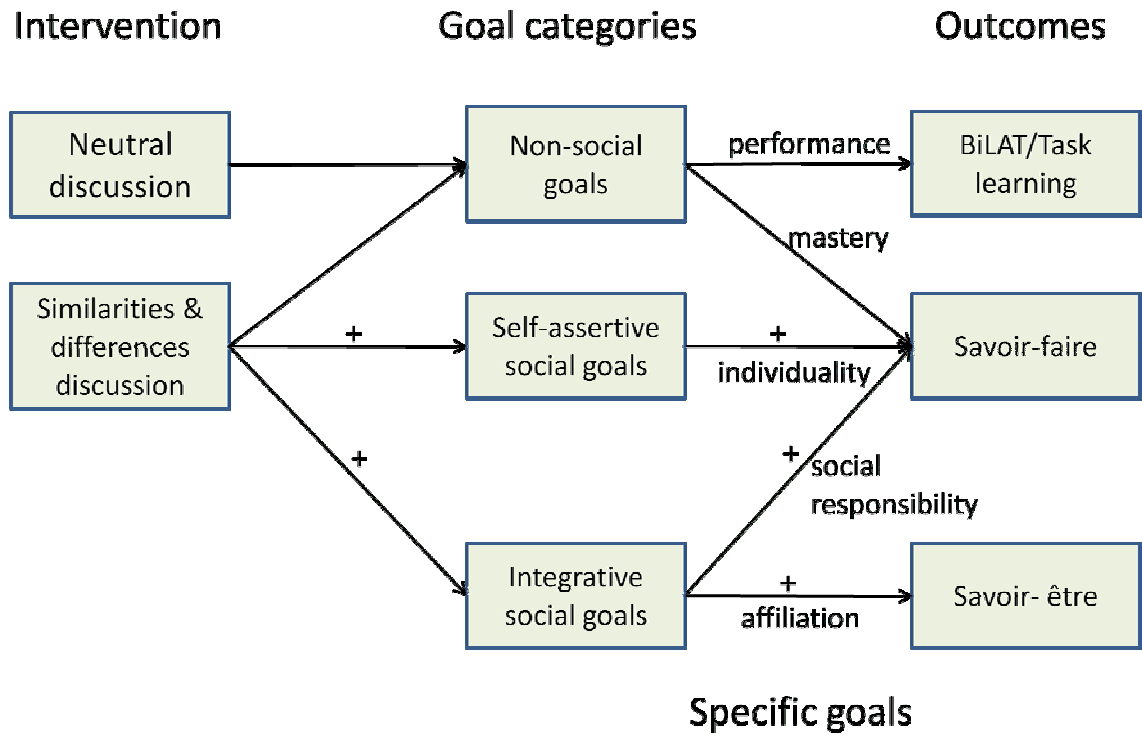


Fig. 5: Model of mediation of outcomes by social goals

In the experimental condition, however, I expect to find increases in both self-assertive social goals and integrative social goals. Specific goals within each of these categories should lead to different outcomes. An integrative goal for affiliation may lead to an increase in positive attitudes towards Arab cultures because, in striving for affiliation, positive self-attitudes will transfer to the other. Social responsibility, a second integrative social goal, may lead to increases in cultural understanding. It includes the desire to avoid committing social errors and to conform to social rules, which may lead to efforts to learn cultural rules so as not to break them. Additionally, a self-assertive goal, individuality, may also lead to increases in cultural understanding. This goal is indicative of a desire to avoid conformity, which may lead to efforts to learn cultural rules so as to separate oneself from the other culture.

I also expect that gameplay will differ between conditions. Several game patterns that may result from these goals could be linked to learning: more exploration, more social actions, more reflection. It is an open question which of these behavioral patterns will lead to more learning; on the one hand, treating the game as a real interaction might transfer well to interactions outside the game. Alternatively, exploration may be a good thing. Well-designed games allow players to take risks with lowered consequences (Gee, 2007), which may lead them to a deeper understanding of why interactions are or are not successful.

These results will begin to answer open questions of whether social goals can be supported in a virtual environment, whether they lead to improved learning outcomes, and how they interact with academic goals. The process measures from the actions taken during gameplay will assist in understanding how students with social goals interact differently with virtual characters, and whether differences in learning can be attributed to differences in how students approach the

game. To more specifically understand the role that the intervention plays in influencing social goals, I will run two more conditions as described in Study 3b.

4.3. STUDY 3B

Study 3b will be a continuation of Study 3a that will attempt to tease apart how social goals are influenced by the intervention of the similarities plus differences condition. To do so, I will introduce two new conditions. In a similarities-only condition, I expect to see increases in integrative social goals. In a differences-only condition, I expect to see increases in self-assertive social goals. These goals should then mediate learning in the same way as Study 3a.

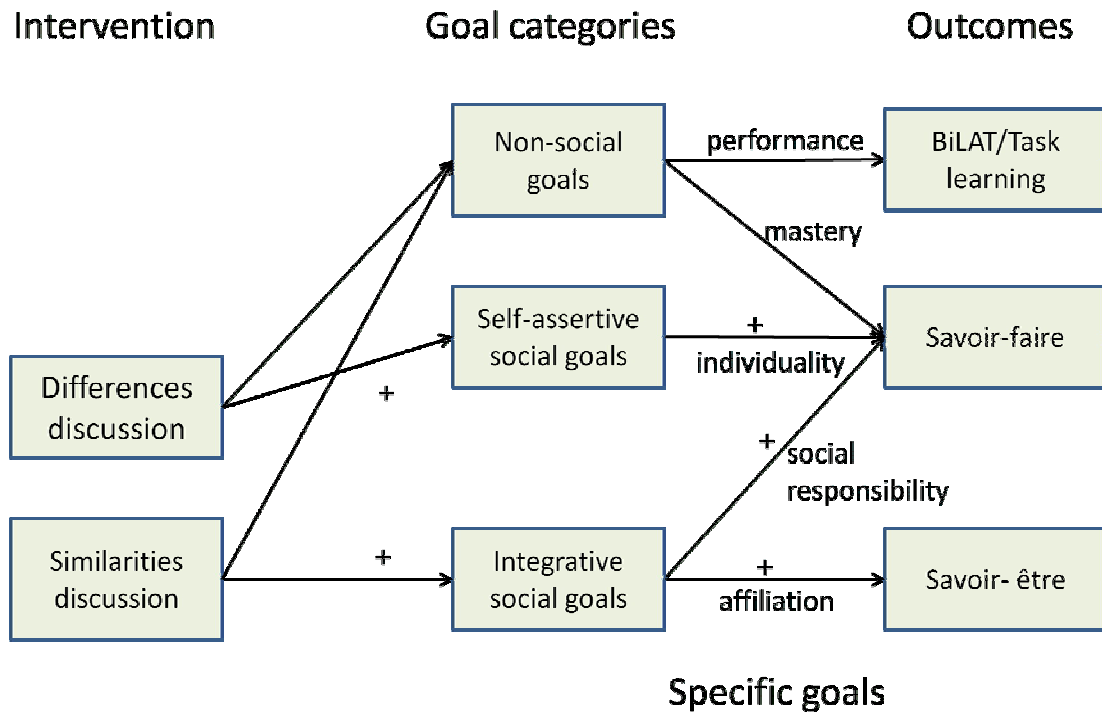


Fig. 6: Model of mediation of outcomes by social goals

5. EXPECTED CONTRIBUTIONS

My thesis work lies at the intersection of the fields of human-computer interaction, learning sciences, and intercultural training. The goals of my proposed work are to 1) develop an intervention that can be built into a virtual learning environment to implicitly scaffold social goals, 2) manipulate students' social goals to better understand the nature of such goals and how they lead to learning, and 3) develop a model of how social goals interact with learner characteristics to influence learning.

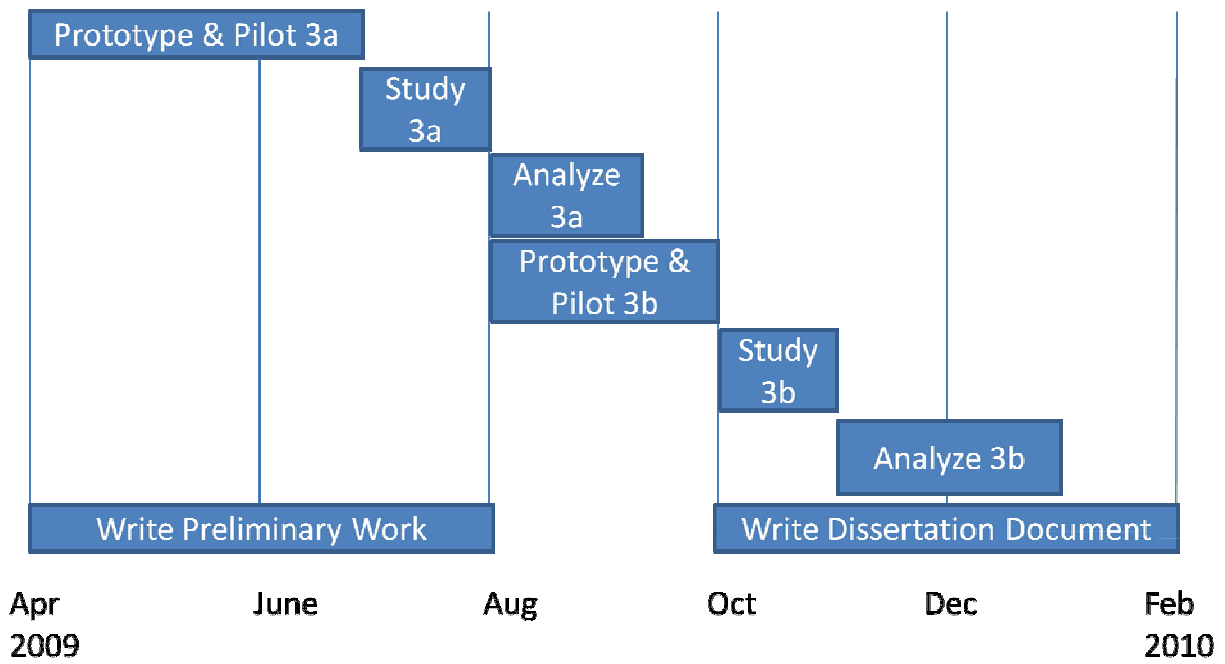
My thesis will contribute to the field of human-computer interaction by utilizing the process of user-centered design to develop improved ways to support learning of intercultural competence through technology. Specifically, I will design effective ways to promote or increase social goals in interactions with virtual humans in a virtual learning environment. This intervention will

provide guidelines for use in other domains in which social learning is accomplished through technology-based environments, and potentially for use in non-technological interventions as well.

I will also contribute to the literature in the learning sciences, specifically research on student motivation. This work will first of all connect social motivation with a cross-cultural learning task involving negotiation. Furthermore, it will increase our understanding of how social goals influence learning in this context, and how they can be promoted to increase learning. Previous research has shown that integrative social goals are beneficial to performance in negotiation tasks, but the role of both self-assertive and integrative goals are unclear in learning intercultural competence. I will differentiate between types of social goals to determine which are beneficial and which are detrimental to learning outcomes, in particular attitudinal changes and the application of cultural knowledge. Finally, I will examine how these social goals interact with one another and with non-social (academic) goals in this context.

Finally, this work will contribute to the literature on intercultural training in several ways. According to the Handbook of Intercultural Training (Landis, Bennett, & Bennett, 2003), there is still a great need for empirical work that determines whether intercultural training can be effective. I expect to demonstrate that a game based in a virtual learning environment can produce successful learning outcomes on cultural learning measures. Additionally, I expect to determine what learner characteristics are associated with better learning of intercultural competence, and how these characteristics influence students' social goals. Finally, I will contribute to understanding whether *savoir-être*, or positive attitudes and empathy, is an important disposition in cultural negotiation in addition to the skills of performing appropriate cultural behaviors, or *savoir-faire*.

6. PROPOSED RESEARCH TIMELINE



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