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So You Think You Can Jump? Perception of Self and Others' Maximum Jumping Capabilities

¿Así que crees que puedes saltar? La percepción de la máxima capacidad de salto en los demás y uno mismo.

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Abstract

The success of our interactions with others depends on cognitive abilities, such as the abilities to perceive, anticipate, and understand other people's actions (Ramenzoni, Riley, Shockley, and Davis, 2008). However, personality traits often times dictate a person's success and expected reward in social contexts. Two experiments investigated people's ability to estimate both their own and other people's jumping capability and how estimates changed depending on people's levels of social anxiety. Estimates were obtained for an horizontal jumping extent using the method of limits and participants' social anxiety level was assessed using two surveys: the Social Interaction Self-Statement Test (SISST; a self-report scale that assesses social anxiety) and the Brief Social Phobia Scale (BSPS; assesses fear or avoidance of various social phobia situations) (Davidson et al., 1991). Experiment 1 showed that participants could accurately estimate the maximum extent they can jump, that their estimations were more accurate from the fixed compared to the preferred starting location, and that participant's estimations were not affected by their level of social anxiety. Experiment 2 extended the findings of Experiment 1 by asking participants to provide estimations for a female and a male model in addition to themselves. Results showed that participants viewed estimating for themselves and estimating for other people as similar perception tasks, however only estimations provided for other people were related with the perceiver's social anxiety. In addition, results showed that participants underestimated both the male and female model's jumping ability, but they underestimated significantly more the male than the female model. Though, the ratios did not vary in accuracy depending on the perceiver's gender, the participants' estimations were correlated with the perceiver's level of social anxiety, such that people exhibiting higher levels of social anxiety estimated that the male and female

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models could do less than did participants scoring low on the social anxiety measures. This is the first study to explore how we perceive affordances for other people within a social context. It found a weak correlation between social anxiety and how we perceive what other's can do towards us. It remains for future studies to explore whether this effect is amplified by changes in state anxiety and whether they generalize to the perception of other action-scaled affordances, especially those that would not encroach on the perceiver's personal space. Overall, the results obtained here open a promising new avenue for the investigation of how our social make-up shapes our perception of the world around us and the people we interact within it.

Keywords: Action understanding ; Affordances ; Perception-Action

Resumen

El éxito de nuestras interacciones con los demás depende de las habilidades cognitivas, como la capacidad de percibir, anticipar, y comprender las acciones de otras personas (Ramenzoni, Riley, Shockley y Davis, 2008). Sin embargo, los rasgos de personalidad a menudo dictan el éxito y la recompensa esperada de una persona en contextos sociales. Dos experimentos investigaron la capacidad de las personas para estimar tanto la capacidad para saltar de ellos mismos como la de otras personas y cómo las estimaciones fueron afectadas por los niveles de ansiedad social de las personas. Se obtuvieron estimaciones para una extensión de salto horizontal utilizando el método de límites y el nivel de ansiedad social de los participantes se evaluó mediante dos encuestas: la prueba de autodeclaración de interacción social (SISST; una escala de autoinforme que evalúa la ansiedad social) y la escala breve de fobia social (BSPS; evalúa el miedo o la evitación de diversas situaciones de fobia social) (Davidson et al., 1991). El Experimento 1 mostró que los participantes podían estimar con precisión la extensión máxima en la que podían saltar, que sus estimaciones eran más precisas desde la ubicación de inicio fija en comparación con la preferida, y que las estimaciones de los participantes no se veían afectadas por su nivel de ansiedad social. El Experimento 2 amplió los hallazgos del Experimento 1 al pedirles a los participantes que proporcionen estimaciones para un modelo femenino y otro masculino además de ellos mismos. Los resultados mostraron que los participantes concebían la estimación por sí mismos y la estimación de otras personas como tareas de percepción similares, sin embargo, solo las estimaciones proporcionadas para otras personas estaban relacionadas con la ansiedad social del perceptor. Además, los resultados mostraron que los participantes subestimaron la capacidad de salto del modelo masculino y femenino, pero subestimaron significativamente más el modelo masculino que el femenino. Sin embargo, las proporciones no variaron en precisión según el género del perceptor, las estimaciones de los participantes se correlacionaron con el nivel de ansiedad social del perceptor, de modo que las personas que exhiben niveles más altos de ansiedad social estimaron que los modelos masculino y femenino podrían hacer menos que participantes con puntajes bajos en las medidas de ansiedad social. Este es el primer estudio que explora cómo

percibimos las posibilidades para otras personas dentro de un contexto social. Encontró una correlación débil entre la ansiedad social y cómo percibimos lo que los demás pueden hacer hacia nosotros. Queda para futuros estudios explorar si este efecto se amplifica por los cambios en la ansiedad del estado y si se generalizan a la percepción de otras posibilidades a escala de acción, especialmente aquellas que no invadirían el espacio personal del perceptor. En general, los resultados obtenidos aquí abren una nueva y prometedora vía para la investigación de cómo nuestra composición social da forma a nuestra percepción del mundo que nos rodea y de las personas con las que interactuamos.

Palabras clave: Comprensión de acciones ; Affordances ; Percepción-Acción.

Introduction

Social interactions are defined by people's similarities and differences in cognitive ability as well as personality and cultural make-up. The success of our interactions with others depends on cognitive abilities, such as the abilities to perceive, anticipate, and understand other people's actions (Ramenzoni, Riley, Shockley, and Davis, 2008). In performing arts and sports, for example, members of a team need to be continually aware of both their own and their partners' actions in order to perform successfully. However, personality traits often times dictate a person's success and expected reward in social contexts. For instance, charming cab drivers and smiling waitresses are likely to receive larger tips than rude ones (Lynn & McCall, 2000). The aim of this project is to explore how personality traits impact people's ability to perceive what others can do. We explored whether individual differences in social anxiety affected people's estimations of how far they and other people can jump.

People can perceive possibilities for action posed by the environment. The concept of affordances crystallizes this notion; it refers to the relation between a given environment and the perceiver's action system (Mark, 1987; Warren and Whang, 1987). Studies have found that people can accurately perceive their affordances for crossing a gap (Mark et al.,1999), stepping across (Cornus et al., 1999), vertical jumping (Pepping et al., 2008; Ramenzoni et al., 2008), and horizontal jumping (Chemero et al., 2003; Montagne et. al, 2000). Two distinct types of affordances have also been identified: body-scaled affordances, that depend on one perceiving the world in terms of absolute body capabilities (e.g., climb-ability and sit-on-ability), and action-scaled affordances, that are also contingent on the individual's ability to make online adjustments based on changes in optical information (e.g., braking, crossing a street) (Warren, 1984; Fajen, 2005). Perception of action-scaled affordances relates to prospective dynamic actions and is affected by the perceiver's own movements (Oudejans, Michaels, van Dort, and Frissen, 1996), changes in the perceiver's action capabilities (Steffanucci, Proffitt, Banton, and Epstein, 2005; Ramenzoni, Riley, Shockley, and Davis, 2008) and intent (Witt, Proffitt, and Epstein, 2005), and the perceived effort the task would require (Proffitt, Stefanucci, Banton, and Epstein, 2003). In all, research findings demonstrate that for both body-

scaled and action-scaled affordances we perceive possibilities for action in terms of our capacity to produce that action.

Research has also suggested that how we perceive the world and objects within it is affected by our experience and expertise (Witt at al., 2008; Witt & Proffitt, 2005). However, the role played by social and personality factors in affordance perception has received relatively less attention (Marsh, Johnston, Richardson, and Schmidt, 2009). The aim of this study is to explore whether variability in perceivers' social characteristics (i.e., level of social anxiety) leads to differences in how they estimate their own ability to perform a dynamic action. Moreover, we explored whether perceiver's social and personality characteristics affect people's perception of what other people can do. This part of the study was motivated by Ramenzoni and col.'s finding that perceivers' ability to estimate what others can do is in part rooted on the perception of their own action capabilities (Ramenzoni, Riley, Shockley, and Davis, 2008). In that study, changes in the perceiver's action capabilities (exerted by adding weights to the participants' ankles) resulted in perceivers underestimating not only their own jumping-reach height, but also that of another person (who did not have weights attached to her ankles). We asked whether estimations of what other's can do could be similarly affected by changes in perceivers' social characteristics.

We chose to explore perceivers' estimations of maximum jumping extent. Horizontal jumping is a dynamic action and, as such, perception of the maximum extent one can jump is affected by factors beyond body make-up. A limited number of studies have explored perception of horizontal jumping and related actions (e.g., gap crossing). Chemero, Klein, and Cordeiro (2003) studied participants' ability to judge when a gap is crossable. They found that people could accurately estimate their ability to cross an extent and that people's estimations varied depending on action capabilities (step length) and not just body dimensions (leg length). Another study that explored what long jumpers do in order to position their feet for a jump showed that people continually use visual information to perceive their jumping ability while approaching a jump launching point (Montagne, Cornus, Glize, Quaine, and Laurent, 2000). These findings support the notion that crossability and jumping should be thought of as action-scaled affordances.

The present study explored the degree to which an individual could predict another person's horizontal jumping ability and whether accuracy in estimating was correlated with social anxiety. It was critical to this project to explore perception of an action-scaled affordance so that when providing estimations for other people, participants could not simply rely on the other person's physical characteristics (such as height or leg length). Experiment 1 investigated whether participants' estimations changed depending on viewing location and social anxiety. It was hypothesized that people would be able to predict their own jumping ability with a moderate level of accuracy and that people with higher levels of social anxiety would predict less accurately for themselves. Experiment 2 extended the paradigm used in Experiment 1 to investigate participants' ability to estimate other people's jumping capability and whether it was affected by the

other person's gender and the participants' level of social anxiety. We expected that people would underestimate their own and other people's maximum jumping extent. In addition, we expected that participants would be more accurate when estimating for a model of the same gender. Finally, we predicted that the perceiver's level of social anxiety would be significantly correlated with their accuracy in estimating for themselves and for other people. However, we did not predict the directionality of that correlation; that is, while perceiver's accuracy was expected to be related to their social anxiety level, that relationship was not expected to be either negative or positive (i.e., higher levels of social anxiety could potentially lead to more or less accuracy in estimation).

Experiment 1

Experiment 1 investigated the extent to which individuals could predict their own jumping ability and whether estimation accuracy was correlated with scores on two social anxiety surveys. Within this framework, we wanted to determine people's ability to predict the maximum jumping extent and whether people's estimations varied depending on two factors: the viewing location and their social and personality characteristics. Participants provided estimations from a fixed location and from a preferred location. Participants' accuracy in estimating their maximum jumping extent was calculated as a ratio of their estimations over their actual jumping performance. Ratios were calculated for both the fixed and the preferred starting locations.

Social interaction levels were assessed using two social surveys, which targeted social anxiety and fear and avoidance of social situations. These particular surveys were chosen to measure how comfortable people feel in social situations (see Appendices A and B). The correlations between scores obtained in the surveys and estimations and accuracy of maximum jumping extent were explored. It was predicted that people's level of social anxiety would be correlated with their estimation, and that estimating from the preferred starting location would contribute to more accurate perception of one's personal jumping capability.

Method

Participants

Twenty undergraduate students (10 female) from the University of Virginia participated in this study in exchange for course credit. Participants ranged in age from 18 to 20 years old (M=18.76 years, SD=0.83 years) and varied in height from 157 cm to 192 cm (M=174.05 cm, SD=9.71 cm), in eye-height from 146 cm to 180 cm (M=161.6 cm, SD=9.28 cm), and in leg length from 80 cm to 103 cm (M=91.25 cm, SD=7 cm). Experimental procedures were approved by the IRB and participants signed informed consent before the beginning of the study.

Apparatus and Materials

An apparatus was designed to obtain maximum jumping extent estimations and measure actual jumping performance. The apparatus consisted of a wooden frame (90 cm wide x 300 cm long x 12.5 cm tall) that sat on level ground. It was painted solid black on all sides as to conceal any markings that could potentially provide distance clues to

the participants. A fishing-reel with a crank was attached to both ends of the apparatus with hooks, and a white ball attached to the fishing-reel's string. The ball was reeled forwards or backwards by an experimenter using the yellow crank. Measuring tape, attached to the side of the apparatus and outside of the participants view, was used to measure the distance of the center of the ball from the starting board on the wooden apparatus (see Figure 1).

Participants' social anxiety level was assessed using two surveys. The Social Interaction Self-Statement Test (SISST) is a self-report scale that assesses social anxiety with such statements as "When I can't think of anything to say I can feel myself getting very anxious" (see Appendix A). The Brief Social Phobia Scale (BSPS) (Davidson et al., 1991) assesses fear or avoidance of various social phobia situations such as "speaking in public or in front of others" (see Appendix B).

Design and Procedure

Experimental sessions were divided in two parts always completed in the same order. During the first part, participants were asked to provide estimations of the maximum extent they could jump from either a fixed location (50 cm from the front of the apparatus) or from a preferred location, and their actual jumping ability from both locations was measured. The preferred location was determined by asking participants to stand at the start of the apparatus and then to step back as far as felt most comfortable to perform the most successful jump they could. Participants did this three separate times, closing their eyes in between estimations as to eliminate visual cues and spatial orientation. The mean of these three preferred locations was marked by a red piece of tape and served as the second starting location (in addition to the fixed starting location already marked at 50 cm from the front of the apparatus).

Estimations were obtained using the method of limits. On each trial an experimenter adjusted the position of a ball using a crank; in half of the trials the ball moved towards and in half of the trials away from the participant. Participants were instructed to tell the experimenter to stop moving the ball when they estimated

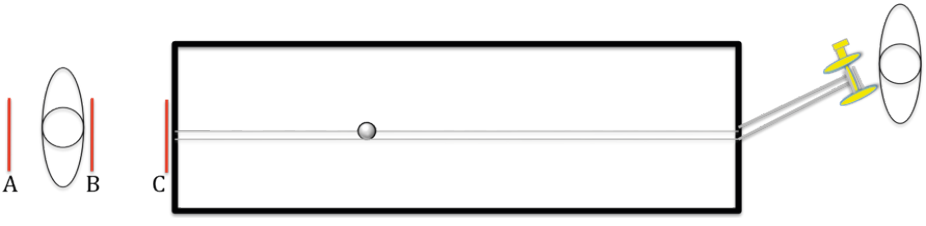

Figure 1. Wooden frame apparatus with invisible fishing line running through the center, attached to either end of the frame with hooks (not visible in figure). *Note*. The fishing reel and crank are shown in yellow, and the red lines indicate the mean preferred location (A), the fixed starting location (B), and the launching point for the jumps (C).

it was at the maximum distance they could jump and land on the ball. Participants had their eyes closed between trials and performed eight fully randomized trials (four from each location). For the purpose of this experiment a "jump" was defined as a horizontal launch using primarily one's legs' strength from the start of the apparatus onto two feet. Participants were told that they could take as many steps as necessary before jumping. The same criterion was used to obtain the estimations and actual jumping ability measures. In order to measure actual maximum jumping extent, participants performed two blocks of three jumps, one block from the fixed starting position and one block from the self-selected starting position. The order in which the blocks were performed was counterbalanced between participants. Participants had no practice jumps prior to the start of the experiment.

During the second part of the experiment participants were brought into a different room where anthropometric measurements were taken for each participant, and participants completed the two social anxiety surveys. The participants were told to read the directions carefully, to take their time, and that they could leave any questions blank that they did not feel comfortable answering.

Results and Discussion

Experiment 1 investigated perception of horizontal jumping ability and whether estimation accuracy was related to the perceiver's level of social anxiety and the location from which estimations were made. The two locations were a fixed location (50 cm) and a self-selected preferred location (M=159 cm, SD=40.20 cm). Participants' accuracy in estimating their maximum jumping extent was calculated as a ratio of their estimations over their actual jumping performance from each location (e.g., a value of 1 would indicate perfect accuracy). On average, participants slightly underestimated their jumping ability from both the fixed (.84) and preferred (.89) locations (see Table 1). While mean ratios from the fixed and preferred locations were correlated, $r(18)$= .79, $p<0.01$, participants' ratios obtained for the fixed location were significantly more accurate than those obtained for the preferred location, $t(19)$=-2.26, $p<0.05$ (see Figure 2). However, correlations between ratios and scores in either of the social surveys were not significant.

In sum, results indicate that participants can accurately predict their own jumping ability using the apparatus created for the purposes of this experiment. Additionally,

Table 1
Maximum Horizontal Jumping Distance for Fixed and Preferred Starting Locations (cm)

Starting Location	Actual	Estimation	Ratio	Error
Fixed	160.03	140.28 (30.07)	0.89 (0.15)	19.75
Preferred	168.88	138.95 (35.82)	0.84 (0.17)	29.93

Note. Error = Actual – mean estimated maximum horizontal-jumping distance. Standard Deviation between parentheses.

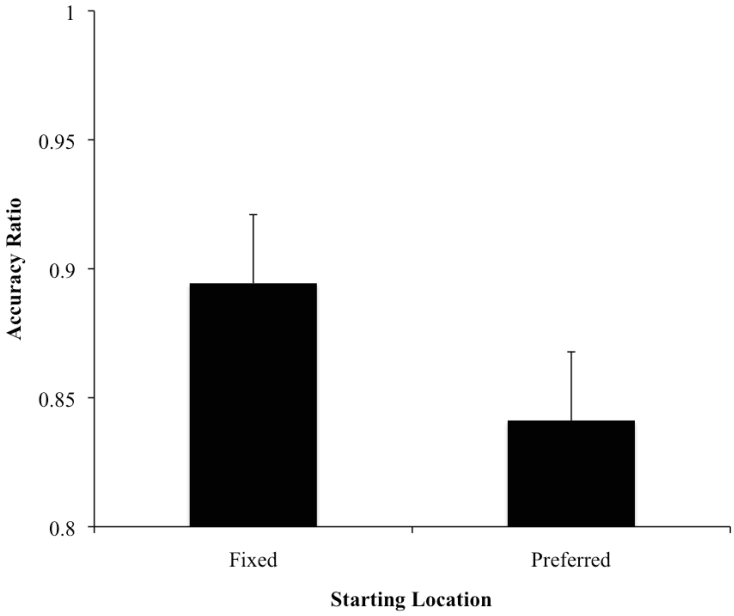

Figure 2. Mean accuracy ratios of estimations of maximum jumping extent/actual jumping ability from the fixed and preferred starting locations.

results revealed that participants' estimations were more accurate from the fixed compared to the preferred starting location. Experiment 2 built on these results by exploring whether participants would exhibit the same accuracy when estimating other people's jumping ability. Based on the results of Experiment 1, we used the fixed starting location in Experiment 2. Participant's also completed the two surveys used in Experiment 1. Though responses were not correlated with estimations provided for the self, we were interested in exploring whether individual differences in social anxiety correlate with perceiver's accuracy in perceiving for other people.

Experiment 2

Experiment 2 investigated a perceiver's prediction of another person's jumping ability and whether estimation accuracy was correlated with perceiver's social anxiety. Participants provided estimations for both themselves and for two models. As in Experiment 1, participants' accuracy in estimating both their and the models' maximum jumping extent was calculated as a ratio of their estimations over their actual jumping performance. Additionally, estimations of maximum jumping extent for female and male perceivers were compared. The same surveys administered in Experiment 1 were used to measure

social anxiety and fear and avoidance of social situations. We expected people's estimations for others to correlate with their level of social anxiety, and we expected that perceivers would be more accurate when estimating for a model of the same gender.

Method

Participants

Thirty-eight undergraduate students (19 females) from the University of Virginia participated in this study in exchange for course credit. Participants ranged in age from 17 to 22 years old (M=18.75 years, SD=0.94 years) and varied in height from 159 cm to 186 cm (M=173.68 cm, SD=8.10 cm), in eye-height from 148 cm to 175 cm (M=162.54 cm, SD=7.93 cm), and in leg length from 74 cm to 102 cm (M=88.23 cm, SD=6.73 cm). Experimental procedures were approved by the IRB and participants signed informed consent prior to beginning the study.

Apparatus and Materials

The same apparatus and social surveys as for Experiment 1 were used (see Figure 1 and Appendix A and B). A male model and a female model participated in this study. The male model was 185.5 cm tall, with an eye-height of 175.26 cm and a leg length of 103 cm. The female model was 160.5 cm tall, with an eye-height of 150 cm, and a leg length of 79 cm. Both models wore t-shirts and athletic shorts throughout the study. Participants did not see and had no contact with the models prior to the start of the experiment.

Design and Procedure

Experimental sessions were divided in two parts always completed in the same order. During the first part, participants were asked to make estimations for their maximum jumping distance from a red line marking their starting location (50 cm from the front of the apparatus). As in Experiment 1, estimations were obtained using the method of limits. On each trial, a ball was moved across the apparatus using a crank; the ball moved towards the participant in half the trials and away from the participant in half the trials. Participants were asked to tell the experimenter to stop moving the ball when they estimated it was at the maximum distance they could jump and land on the ball. Participants closed their eyes between trials and made four repeated estimations. A "jump" was defined as a horizontal launch using primarily the strength in one's legs from the start of the apparatus into a landing position on both feet within the wooden frame. Participants were told that they could take as many steps as they felt they needed to before launching from the start of the frame.

The experimenter explained that the next phase of the experiment required that they estimate another person's maximum jumping extent. The experimenter showed the participant a starting location at 50 cm at the other end of the apparatus. Participants provided estimations for the male and female models while standing at their initial location (same throughout the experiment). Models stood barefoot on the red line 50 cm from the apparatus on the opposite side of the participants or were concealed in a hallway hidden from the participants' view, depending on the experimental condition (see Figure

3). Participants were instructed to tell the experimenter to stop moving the ball when it indicated the farthest extent that either the male or the female model could jump from his or her current position. The models stood still with their hands by their sides and looked down, watching the ball as the experimenter reeled it forwards and backwards. The order in which the estimations were performed was counterbalanced.

Actual maximum jumping extents were then obtained. Participants performed six fully randomized jumps in three conditions: two where the opposite side of the apparatus was empty, two where the male model stood on the opposite side, and two where the female model stood on the opposite side.

At the end of the second part of the experiment, participants went into a different room where anthropometric measurements were taken for each participant. Additionally, participants completed the two social anxiety surveys. The participants were told to read the directions carefully, to take their time, and that they could leave any questions blank that they did not feel comfortable answering.

Results and Discussion

Experiment 2 investigated a perceiver's estimation of their own and other people's horizontal jumping ability and whether accuracy in estimation was related to the perceiver's level of social anxiety. One participant was excluded from the analyses, as his estimations were more than two standard deviations from the median.

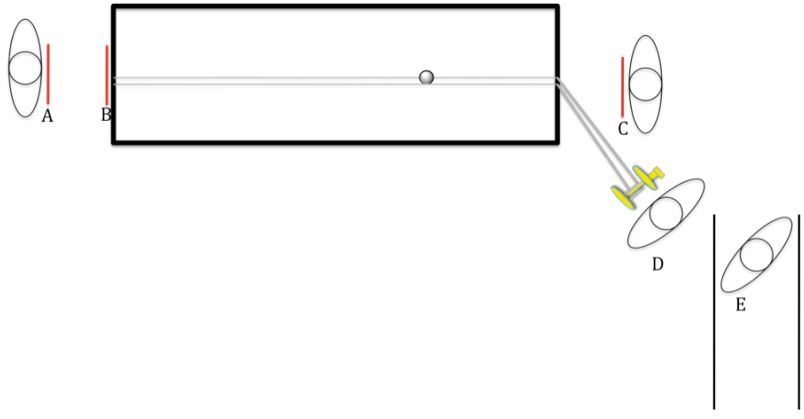

Figure 3. Wooden frame apparatus with experimental setup for Experiment 2. *Note*. As in Figure 1, the fishing reel and crank are shown in yellow next to the experimenter (D). The red lines indicate the starting locations for the participant (A), the launching point for the participants' jumps (B), and the models' starting location (C). The second model (E) is shown waiting in the concealed hallway.

Participants' accuracy in estimating their own and the models' maximum jumping extent were calculated as ratios of their estimations over their or the models' actual jumping performance. Participants underestimated their own (.92) as well as the male (.69) and female (.78) models' jumping ability (see Table 2). Similarly to the previous experiment, participants predicted their own jumping ability with very high accuracy and, as expected, they were more accurate when estimating their own compared to the either model's maximum jumping extent. In general, ratios were on average higher for male participants than for female participants. Mixed ANOVA with perceiver gender as a between factor and model gender as a within factor revealed a main effect for model gender, $F(35)=57.409$, $p<0.001$, $\eta^2=0.62$ (see Figure 4). The gender of the perceiver did not affect the accuracy of their estimations. However, participants underestimated the male model significantly more than the female model and their estimations for the male and the female models were highly correlated, $r(35)= 0.80$, $p<0.01$.

Mean ratios obtained for self-estimations were correlated with those obtained for both the male ($r(35)= 0.58$, $p<0.01$) and female ($r(35)= 0.54$, $p<0.01$) models. These results were surprising given differences in task demands. While participants were judging in reference to a forward extent for themselves, they were asked to estimate the other person's maximum jumping ability as if the other was jumping towards them. However, these results suggest that despite differences in task demands participants estimations for themselves and those provided for others are related.

Social anxiety levels were weakly correlated with the estimations that participants made for both the male ($r(146)= -.18$, $p<0.01$) and female models ($r(146)= -.21$, $p<0.05$). These results show that the higher the level of social anxiety people exhibited, the lower their estimations were for the male and female models, illustrating that people that were high in anxiety thought that the models could jump less when jumping towards them.

In all, Experiment 2 suggests that participants viewed estimating for themselves and estimating for other people

Table 2
Actual and Estimated Maximum Jumping Distances for Self and Models (cm)

Type of Estimation	Actual	Estimation	Ratio	Error
For Self	150.56	136.50 (28.43)	0.92 (0.17)	14.06
For Male Model	215.67	148.10 (24.97)	0.69 (0.12)	67.57
For Female Model	160.00	125.88 (20.64)	0.78 (0.13)	34.12

Note. Error = Actual – mean estimated maximum horizontal-jumping distance. Standard Deviation between parentheses.

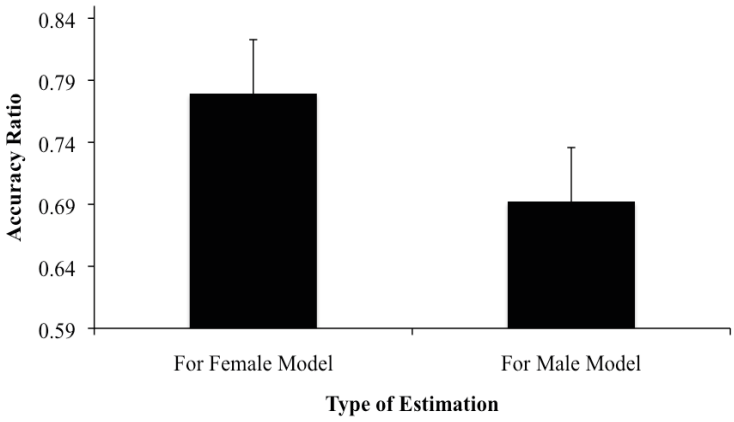

Figure 4. Mean accuracy ratios of estimations of maximum jumping extent/actual jumping ability for the male and female models.

as similar perception tasks, however only estimations provided for other people were related with the perceiver's social anxiety. In addition, the results show that participants underestimated for both the male and female model, but they underestimated significantly more the male than the female model. Though, the ratios did not vary in accuracy depending on the perceiver's gender, the participants' estimations were correlated with the perceiver's level of social anxiety, such that people exhibiting higher levels of social anxiety estimated that the male and female models could do less than did participants scoring low on the social anxiety measures.

General Discussion

The present study investigated people's ability to estimate their own and another person's maximum jumping extent and whether this ability changed depending on the perceiver's social anxiety. The results of this project have important implications and bring together two related areas of research: affordance perception and individual differences in social and personality make-up. Much in line with previous research (Chemero et al., 2003; Montagne et. al, 2000), the results of Experiment 1 showed that people tend to underestimate affordances for horizontal jumping, that their accuracy increases when they estimate from a fixed instead of a preferred location, and that participants' ability to estimate is not related with their social anxiety. Experiment 2 further explored the relation between personality traits and social perception; it examined whether social anxiety impacts people's cognitive ability to perceive what themselves and other people can do. Results showed that social anxiety levels did not affect how individuals perceive the

environment in general, but do relate to how they estimate other people's ability to act in reference to the perceiver.

In terms of the ability to perceive this action-scaled affordance, we found that perceivers slightly underestimated their own and other people's jumping ability. Moreover, perceiver's estimations of their own jumping ability varied depending on the viewing location. Though estimations for both locations were highly correlated, perceivers were more accurate (underestimated less) from a fixed than from a self-selected preferred location. A possible, though highly speculative, explanation for this effect is that changes in viewing location affected the size of the perceived extent independently of participants' perceived jumping ability. If estimation of the 'maximum extent one can jump' is thought of as an instance of size perception, the further away perceivers stood from the apparatus the smaller their estimations would be. Because the preferred location was always larger than the fixed location, perceivers were further away from the apparatus at their preferred location than they were at the fixed location, which would in turn account for their perceived maximum extent decreasing for the fixed location.

Perceivers also underestimated the maximum jumping ability of other people regardless of their gender. Estimations for both models were highly correlated, though participants underestimated the male model's jumping ability significantly more than that of the female model. This result contradicts previous findings that showed that affordance perception for other people does not vary depending on the other person's gender (e.g., Ramenzoni, Riley, Shockley, and Davis, 2008). This discrepancy in results might have been related to differences in the type of affordances explored in this study we looked at horizontal jumping and Ramenzoni and cols. explored vertical jumping and vertical reaching. While in the vertical jumping case the apparatus' upper bound (it's maximum height) allowed for a large range of responses, our apparatus allowed for a more limited range. For instance, it is possible that the apparatus may have been too short for people to accurately perceive the male but not the female model's maximum jumping extent. Because the female model could jump much less distance, the apparatus might have allowed for more accurate estimations of her jumping ability.

The central aspect of this project was the exploration of affordance perception in terms of social action. The social anxiety levels of the participants in Experiment 1 were not related to their estimations for their maximum jumping extent. The lack of effects of individual differences in social and personality make-up on perception should be qualified in light of previous findings on the topic, as well as the measuring tools employed in this study. Pijpers and cols. found that anxiety reduces people's perceived maximal reaching height on a climbing wall (Pijpers, Oudejans, Bakker, and Beek, 2006). In that study, the authors manipulated people's current emotional states (inducing an increment in anxiety) by testing them at varying heights on a wall. Here we chose to focus on social traits instead of emotional states and measured those using survey reports. We found that the level of social anxiety perceivers experience did correlate, albeit weakly, with their estimations for other people. Perceivers who have higher levels of social anxiety provided lower estimates

of other people's jumping ability. It is important to note that perceivers were asked to estimate as if the other person was to jump towards them. A tentative interpretation of these results is that participants with higher levels of social anxiety wished to keep more distance between themselves and the models, which resulted in lower estimations of the models' jumping extent (lower estimations indicated that the models would jump and land further from the participants). This manipulation situated the task within a social context; it remains to be explored whether a similar effect of social anxiety on perception of affordances for others can be found when judging independently of the social context (i.e., estimating maximum extent the other person could jump if he/she was standing at the perceiver's current location).

In conclusion, this study illustrates the relationship between perception of action-scaled affordance for self and others, and social anxiety. Furthermore, it is the first study to explore how we perceive affordances for other people within a social context. The correlation with trait anxiety was weak and only found when estimating what others can do. It remains for future studies to explore whether this effect is amplified by changes in state anxiety. It would also be important to explore whether these effects were due to the characteristics of the task explored here (i.e., maximum jumping towards the perceiver) or generalize to the perception of other action-scaled affordances, especially those that would not encroach on the perceiver's personal space. A final extension to this project worth exploring is whether this effect is contingent on the task providing a social context.

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Appendix A

Survey 1: Social Interaction Self-Statement Test (SISST)
It is obvious that people think a variety of things when they are involved in different social situations. Below is a list of things you might have thought to yourself at some time before, during, or after the interaction in which you were engaged. Read each item and decide how frequently you were thinking a similar thought before, during, and after the interaction. Circle the number from 1 to 5 for each item. The scale is interpreted as follows.

1=hardly ever had the thought
2=rarely had the thought
3=sometimes had the thought
4=often had the thought
5=very often had the thought

Please answer as honestly as possible.

1. When I can't think of anything to say I can feel myself getting very anxious.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

2. I can usually talk to someone I am attracted to pretty well.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

3. I hope I don't make a fool of myself.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

4. I'm beginning to feel more at ease.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

very often

5. I'm really afraid of what this person I am attracted to will think of me.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

6. No worries, no fears, no anxieties.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

7. I'm scared to death.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

8. This person I am attracted to probably won't be interested in me.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

9. Maybe I can put this person at ease by starting things going.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

10. Instead of worrying I can figure out how best to get to know this person.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

11. I'm not too comfortable meeting people I am attracted to, so things are bound to go wrong.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

12. What the heck—the worst that can happen is that this person won't go for me.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

13. This person may want to talk to me as much as I want to talk to him or her.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

14. This will be a good opportunity.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

15. If I blow this conversation, I'll really lose my confidence.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

16. What I say will probably sound stupid.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

17. What do I have to lose? It's worth a try.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

18. This is an awkward situation, but I can handle it.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

19. Wow—I don't want to do this.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

20. I would crush me if this person I am attracted to didn't respond to me.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

21. I've just got to make a good impression on this person or I'll feel terrible.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

22. You're such an inhibited idiot.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

23. I'll probably "bomb out" anyway.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

24. I can handle anything.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

25. Even if things don't go well it's no catastrophe.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

26. I feel awkward and dumb; this person is bound to notice.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

27. We probably have a lot in common.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

28. Maybe we'll hit it off real well.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

29. I wish I could leave and avoid the whole situation.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

30. Ah! Throw caution to the wind.

1	2	3	4	5
hardly ever	rarely	sometimes	often	very often

Appendix B

Survey 2: The Brief Social Phobia Scale (BSPS)

Please check the best response: How much do you fear and avoid the following situations?

Fear Rating

	Never	Mild	Moderate	Severe	Extreme
Speaking in public or in front of others					
Talking to people in authority.					
Talking to strangers.					
Being embarrassed or humiliated.					
Being criticized.					
Social gathering.					
Doing something while being watched (this does not include speaking).					

Avoidance Rating

	Never	Rare	Sometimes	Frequent	Always
Speaking in public or in front of others					
Talking to people in authority.					
Talking to strangers.					
Being embarrassed or humiliated.					
Being criticized.					
Social gathering.					
Doing something while being watched (this does not include speaking).					

When you are in a situation that involves contact with other people, or when you are thinking about such a situation, do you experience the following symptoms?

	Never	Mild	Moderate	Severe	Extreme
Blushing					
Palpitations					
Trembling					
Sweating					

Total Scores: F=_____ F= _____ F= _____ Total= _____