UNIVERSITY OF TWENTE.

Faculty of Behavioural,
Management & Social Sciences

The Uncanny Valley Phenomenon

A replication with short exposure times

Peter J.H. Slijkhuis
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Supervisors:
dr. M. Schmettow
prof. dr. F van der Velde

Cognitive Psychology and Ergonomics
Faculty of Behavioural,
Management & Social Sciences
University of Twente
P.O. Box 217
7500 AE Enschede
The Netherlands

Index

Abstract

Research repeatedly observed that artificial characters and robots with a human appearance can create an impression of uncanniness in the observer, when reaching a certain level of human likeness. Hypotheses about the origins of this phenomenon called the "Uncanny Valley" are divergent. One group hypothesizes about a fast system, the other of a more conscious processing. The present study was set up to investigate how long participants need to form a stable judgment of uncanniness for robot faces, to see what happens to the lowest point of the valley when the exposure times differ, to look at the possibly involved processes of categorizing faces and to see whether the uncanny valley effect generalized across participants. Thirty-nine participants rated the eeriness of robot faces that varied in human-likeness. These ratings were done with presentation times of 50ms, 100ms, 200ms and 2s. In essence, this part of the study was a replication of a study by Mathur and Reichling (2016), using their stimuli set with extra stimuli added around the expected valley areas and with shorter presentation times. The results show that all participants individually have a characteristic uncanny valley curvature in the long condition and almost all participants have the curvature in the shorter conditions. This suggests generalizability of the uncanny valley. The lowest point of the valley, the trough, shifts towards lower human-likeness when the presentation times get shorter. This also suggests that the cognitive process of category confusion has something to do with the uncanny valley.

Keywords: uncanny valley, short presentation times, trough shift, generalizability, category confusion

Introduction

The Uncanny Valley

New technological advances starting in the last century have resulted in an increased usage of artificial human characters in varying areas. In the 1990s Pixar made Toy Story, the first fully animated movie. Since this milestone, more and more movies make use of computer-generated imagery (CGI) to create artificial human characters. Not only to make a fully animated movie, but also adding characters to a real-life movie that look increasingly more realistic. Not only movies make use of this technology, but the vastly increasing field of computer games uses this as well. In 2016, a survey found that over 150 million people in the U.S. played video games, with an average of 1.7 gamers in a game-playing U.S. household (Entertainment Software Association (ESA), 2016). This trend of an increased exposure to artificial characters is expected to continue in the future, not only because of the increasing usage of computer games, but for example also due to robots that are planned to be involved in the care of elderly people (Bemelmans, Gelderblom, Jonker, & de Witte, 2012) The acceptability of robots is a widely discussed topic. To increase the acceptability and to make the social aspects as natural as possible, robots are mostly designed to resemble the appearance of a human being. In the three areas mentioned, technological advances allowed the artificial characters to become more realistic in their appearance. At first, this seems as something positive, but increases in realism turned out to have a negative side. With increased realism, the little faults in the appearance of the artificial character that prevent them from being indistinguishable from a real human-being can induce a creepy impression in the human observer, the Uncanny Valley.

The uncanny valley is a phenomenon that states when stimuli reach near-perfect resemblance to humans, a feeling of uncanniness occurs from the presentation of the stimuli (Burleigh, Schoenherr, & Lacroix, 2013). The term Uncanny Valley was first mentioned by Masashiro Mori (1970). Dr. Masahiro Mori, a Professor of Engineering at Tokyo Institute of Technology, put forth a thought experiment. He said to assume we could make a robot more and more similar to a human in form, would our affinity to this robot steadily increase as realism increased or would there be dips in the relationship between affinity and realism. Mori thought himself the latter would be the case, as the robot became more human-like there would first be an increase in its acceptability and then as it approached a nearly human state there would be a dramatic decrease in acceptance. He coined this drop “bukimi no tani” the translation into “uncanny valley” has become popularised. It is known as a ‘Valley’ because there is an area roughly between 70%-90% of total human likeness where, when expressed graphically, there is a radical shift from positive to negative affect (see figure 1). This shift symbolizes a valley when plotted against familiarity, affinity, social acceptance or some other measure of approval.

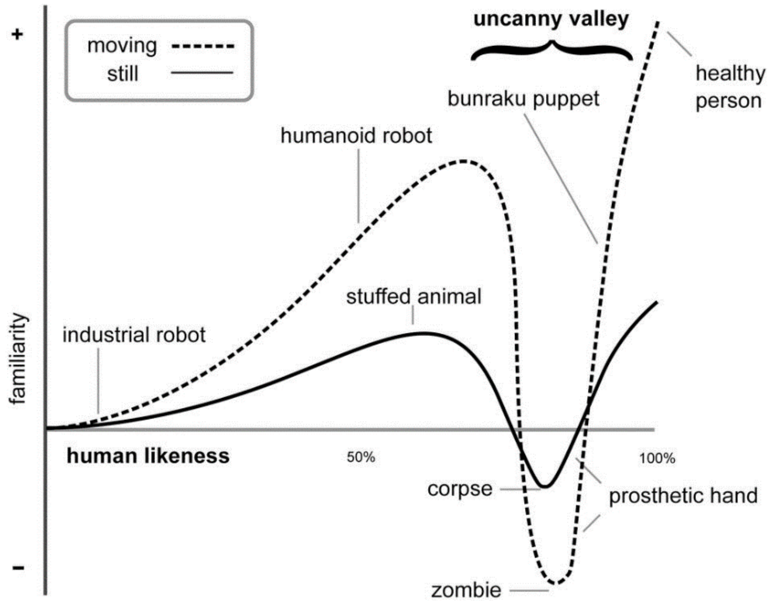

Figure 1. Uncanny Valley Plot with Familiarity and Human likeness

The nonhuman imperfections induce a mismatch between the human qualities that are expected and the nonhuman qualities that are observed instead (MacDorman, Green, Ho, & Koch, 2009). When their appearance approaches that of a real human being, ratings rise again until reaching the same response as a human being. Mori (1970) further suggested that movement of artificial characters amplifies the effect of human-likeness on the emotional response. Examples that, according to Mori (1970), fall into the uncanny valley are zombies, prosthetic hands or mannequins that came to life.

Even though the phenomenon was defined in the 1970s, research on an uncanny effect dates back to the early 1900s (Jentsch, 1997). Since Mori (1970), research has focused on providing explanations for the Uncanny Valley Phenomenon with regards to more modern technology such as computer generated characters, advanced robotics, artificial limbs, and even zombies (Gray & Wegner, 2012; Tinwell, Nabi, & Charlton, 2013). While this phenomenon has been believed to be true for a long time, there has not been very much systematic scientific research on the uncanny valley.

It is not yet clear what cognitive processes are responsible for the experiences associated with the uncanny valley. Different hypotheses were proposed overt time to try and find an explanation of why nearly human-like artificial characters and robots would induce negative feelings in humans. Within these explanations there are roughly two groups, the fast and slow processing. The first category explanations propose automatic, stimulus-driven and rather specialized processing that takes place early in perception. It is speculated that the same processes that evolved to provide humans with a way of extracting information rapidly from human faces, could be responsible for producing feelings of uncanniness associated with the uncanny valley (MacDorman et al., 2009). If this processing is indeed involved, it would be expected humans are able to judge the level of uncanniness of artificial faces in a similar time as to be needed for the evaluation of human faces.

The second category explanations propose the use of a broader range of cognitive processes, including a rather conscious evaluation that results in feelings of uncanniness. According to these hypotheses, a stimulus needs to be processed further than the early stages of perception, as in category one, and would therefore need more time to be completed. The differences between the fast and slow processes believed to play a part in the Uncanny Valley phenomenon shows that there is a distinct gap in the knowledge that is necessary to understand why nearly human-looking artificial characters and robots are often considered to be uncanny.

The goal of this research is therefore to conduct an experiment that will help to narrow down the possible explanations for the processes involved in the uncanny valley, but also to see if the uncanny valley effect is present and can be generalized for all individual participants. To do this, images from the entire human likeness scale need to be used.

Firstly, a review of the relevant literature is needed and then the recent explanations on the Uncanny Valley need to be described. Based on this review, an experiment will be constructed that enables the investigation into the above-mentioned goals. The outcomes can hopefully be seen as an indication for the processes involving the uncanny feelings brought forth by the Uncanny Valley and it will hopefully show a generalizable effect for the entire population.

If people are able to form a judgment of about a face after very short exposure times, 63ms found in Or and Wilson (2010), this would be a clear indication that a fast, automatic and specialized processing is involved in the evaluation of (artificial) faces. If, on the other hand, people need to observe an artificial face significantly longer to form a judgment of uncanniness than is needed for a human face, then it is likely that the processes that evolved to evaluate human faces are not responsible for the production of the negative feelings associated with the uncanny valley. When the exposure times are very short, the valley might disappear completely or shift along the human likeness axis, in comparison to longer exposure times.

Facial recognition

The perception of human faces by other human beings was consistently found to be a highly-specialized process that is distinct from the perception of other objects. This is called domain-specificity, which means
that faces can be considered as a “special” category of objects that are processed by holistic mechanisms (McKone, Kanwisher, & Duchaine, 2007). An example of behavioural evidence for such a domain-specific specialization is that the recognition of faces is disturbed more when the face is turned upside down than it is for other objects (Yin, 1969).

Quite some research was done on how fast a person is able to process a face. A research conducted by Grill-Spector and Kanwisher (2005) showed that the grouping of a certain object occurs just as fast as the detection of a stimulus within the visual field. This effect could be seen for exclusion times going as low as 17ms. The finding that object grouping took place as fast as object recognition indicates that both processes may occur at the same time (Grill-Spector & Kanwisher, 2005). This research was followed by research done by Or and Wilson (2010). They found that both face identification and viewpoint recognition of a face take significantly more time to be completed than mere face detection. They found that participants in their study needed an average of 63ms of stimulus presentation to recognize a detected face, and an average of 56ms to recognize the viewpoint of the detected face. So according to the results of their experiment, the whole process of face recognition is completed after 63ms and can therefore be considered an automatic process.

Also important is evidence suggesting that people can form judgments about faces that were presented for a shorter period of time than is needed for face recognition. A research conducted by Bar, Neta, and Linz (2006) investigated how much time people need to form a judgment of traits concerning a face with a neutral expression and found that participants were able to form a relatively stable judgment of threat for a face after an exposure of just 39ms. When looking back at the two cognitive systems, this would be a very good predictor for the fast system, the quick recognition of a threat (Park, Faulkner, & Schaller, 2003).

It was further found that a stimulus can not only be categorized as object or face, but that participants also form some sort of judgment about the face for presentation times as low as 17ms. Stone, Valentine, and Davis (2001) found that after 17ms presentation time, participants were able to categorize faces into good and evil with an accuracy better than chance. This suggests that there is not only an effect on unconscious, involuntary body reactions like skin conductance, but that there is also some influence on the judgment of participants for extremely low presentation times.

When these findings are looked at together, it shows that facial recognition is mostly a fast and specialised process. The specialized processing allows humans to automatically form judgments in a small part of a second, based on the visual appearance of a face. Evidence suggests that people are faster to judge a face concerning a trait like threat than to recognize a familiar face. When pairing facial recognition and the uncanny valley, it is expected that humans are just as fast in forming a feeling of uncanniness in CGI characters' faces, as they are in perceiving threat in real human faces.

Cognitive processes: Fast processing

As spoken of before, the general idea is that cognitive processing of CGI characters, which causes the Uncanny Valley, can be split up into two major groups of explanations.

The first group are the hypotheses of a fast system, with automatic and specialized processes. One argument for a fast-cognitive system is evolution. Being good at recognizing a beautiful and healthy face would help in reproducibility, this is can be called evolutionary aesthetics. Humans are very fast in the judgement of a face and it shows almost unanimous ratings when asked to rate the beauty of a face (Olson & Marshuetz, 2005; Willis & Todorov, 2006). In a research by Law Smith et al. (2006) a link was made between facial features in a woman and her oestrogen levels. The perceived good features in a woman's face were linked with higher levels of oestrogen and is believed to be an indication for their reproductive fitness. Thornhill and Gangestad (1999) researched facial attractiveness and found that the facial features people judge as attractive were found to be indicative for their reproductive fitness. The perceptual and cognitive mechanisms that are involved in the perception of unattractiveness for people lacking these features might be the cause for the feeling of aversion which is associated with the uncanny valley (MacDorman et al., 2009).

Another argument is called threat and disease avoidance (Park et al., 2003). This incorporates the theory of disgust mentioned by Rozin and Fallon (1987). This theory says that people experience a feeling of disgust when confronted with an individual that seems abnormal. The reasoning behind this theory is that abnormalities to someone's face could have indicated some form of disease that may have been dangerous. When noticing these abnormalities very quickly in the past, the chances of survival would have increased. This mechanism is called pathogen avoidance. MacDorman and Ishiguro (2006) state that the uncanny valley is caused through an evolved mechanism for pathogen avoidance. The more similar an organism looks to a human being, the stronger the negative affective response to its deficits. The reason for this is that deficits indicate disease and a human-like appearance indicates genetic similarity, which in turn increases the probability of contracting disease-causing bacteria, viruses and other parasites (MacDorman et al., 2009). So, if a CGI character shows signs of imperfections, the disease-avoidance process might make for a disgust response to avoid a potentially contagious disease (Park et al., 2003). This means that a lack of facial expressions or other abnormal facial features can cause one of these mechanisms that lead to an uncanny feeling (Macdorman & Entezari, 2015; Seyama & Nagayama, 2007; Tinwell, Grimshaw, Nabi, & Williams, 2011).

One hypothesis is that is also fast and related to facial features is the idea that people rely on other's facial expressions to learn more about possible threats in their surroundings (Blair, 2003). This allows them to protect themselves from transmittable diseases, just as the theory mentioned before, but by relying on other individuals' expressions. However, CGI characters can sometimes have a difference in human facial expressions than with humans (Tinwell et al., 2011, 2013). Because of this, an effective communication of emotions is inhibited. This means that the observer cannot derive information regarding expressions from the CGI character's face, which might lead to feelings of discomfort.

A similar study to this one by Moll and Schmettow (2015) found that 50ms are enough to form a reliable judgment about the eeriness of a face. He suggests that the fear and disgust systems are involved in these rapid evaluations and provide strong evidence for the involvement of the fast system. He also assumes that extremely specialized automatic face recognition processes are part of the explanation.

Cognitive processes: Slow processing

The second group of cognitive processing of CGI characters are the hypotheses of a slow system, evaluative processes that involve conscious reflections and higher cognitive processing. It is assumed that these mechanisms require more time to process a stimulus and form a judgment than the mechanisms that are part of the fast system theories.

One theory is that of Jentsch (1997). He wrote in his essay that a feeling of discomfort is created in persons when they have problems to categorize a stimulus and was first to name the term 'category uncertainty' to describe this effect. Category uncertainty can arise when certain features of a face seem to belong to one category while some features appear to belong to another. Therefore, when presented with CGI face that is slightly modified, people might have problems categorizing the face as it might belong to a human or alternatively to a virtual character (Macdorman & Entezari, 2015). This form of category uncertainty was found to be one of the causes of the uncanny valley (Moore, 2012).

A second theory uses the cognitive dissonance of liminal objects, which means that the feeling of uncanniness arises because robots pose a challenge to the uniqueness of human beings. “Robots and CG characters are liminal objects, lying on the boundary of human and nonhuman, calling into question the very distinction” (MacDorman et al., 2009). It is proposed that this cognitive dissonance and certain kinds of experiences associated with the uncanny valley may have common ground (Pollick, 2009). It is speculated that human-like robots, liminal between robots and humans, could lead to the thought that human beings are just machines themselves and therefore mortal entities that have no hope for existence after death (MacDorman et al., 2009). This feeling of one’s own mortality may lead to the experience of negative emotions associated with the uncanny valley.

Macdorman and Entezari (2015) found a number of traits linked to the uncanny valley sensitivity with slow processing. The four traits are a negative attitude towards robots, animal reminder sensitivity (one’s own mortality), human-robot uniqueness and religious fundamentalism. According to their findings, a person that scores high on these traits will experience the effects of the uncanny valley stronger than a person that does not show these traits. However, it is assumed that they can only influence the ratings if a person has enough time to consciously reflect on a given stimulus, this means that stimuli with shorter exposure times are not likely to be influenced by these slow processes. Another thing is that the results of this research only says something about uncanny valley sensitivity for videos of androids. However, CGI characters resemble humans just like androids and are also synthetic characters. One can therefore think of a connection between the two and that these traits may also be an explanation with CGI characters.

To conclude, hypotheses from the first category involve specialized processes. These processes enabled humans to form a judgment in a fast and automatic way, without the need for a conscious evaluation of the observed information. On the other hand, the second category theories are rather the result of cultural influences. Since this cognitive evaluation of a CGI character includes a conscious reflection, they result in longer processing times when forming a judgment than what would be expected if a specialized processing is involved. Because of this difference in the expected processing time, the actual time that participants need to form a stable judgment of uncanniness could be used as an indication which processes are involved in the production of the negative feelings associated with the uncanny valley.

Category confusion

Although Mori (1970) proposed the uncanny valley in 1970, Jentsch, as early as 1906, developed a theory identifying category uncertainty as the cause of uncanniness (Jentsch, 1997; MacDorman & Ishiguro, 2006). He asserts that eerie feelings are most reliably elicited by uncertainty about whether an entity is inanimate or animate, or whether it is nonhuman or human. Category uncertainty occurs whenever robot faces transition from one category to another. For example, mechanical features and human-likeness. The Uncanny Valley graph depicts the feelings people have when looking at robots with very mechanical features to robots that are more human-like. Beyond the effects of categorical perception, transitions along nonhuman–human scales could be disturbing because they undermine the separation between what we identify as us (e.g., human, person) and what we identify as *not* us (e.g., 3D model, robot: Macdorman & Entezari, 2015; MacDorman et al., 2009)

A prominent hypothesis (Kätsyri, Förger, Mäkäräinen, & Takala, 2015) says that the Uncanny Valley arises from ambiguity that is experienced at the boundary between perceptual categories (de Gelder, Teunisse, & Benson, 1997; Repp, 1984). In this case, between non-human and human categories. Such category confusion is measured experimentally as an increase in the time required to categorize a stimulus (de Gelder et al., 1997; Pisoni & Tash, 1974). Yamada, Kawabe and Ihaya (2013) had another explanation for the uncanny valley effect. Their explanation is that difficulty in categorizing ambiguous entities results in the formation of negative impressions. Thus, categorization difficulty predicts that the most ambiguous representations are perceived as the least likeable. Categorization difficulty (i.e., low processing fluency) is operationalized as longer response times during a categorization task. It is speculated that subjects' ratings of the amount of category-typical mechanical or human-resemblance would exhibit a similar delay in response time for stimuli near a potential categorical boundary. Cheetham, Wu, Pauli, & Jancke (2015) however found no support for the notion that category ambiguity along the human likeness scale is specifically associated with enhanced experience of negative affect, however it does not directly examine the uncanny valley in the domains where it is typically identified: humanoid robotics and 3D computer animation.

To explain the uncanny valley effect, MacDorman & Chattopadhyay (2016) have developed an alternative theory to category confusion, realism inconsistency. The realism inconsistency theory predicts that features at inconsistent levels of realism in an anthropomorphic entity cause perceptual processes in viewers to make conflicting inferences regarding whether the entity is real. Such inconsistency could violate neurocognitive expectancies, resulting in large feedback error signals (Saygin, Chaminade, Ishiguro, Driver, & Frith, 2012). Prediction error could lead to a negative emotional appraisal and avoidance behaviour (Cheetham, 2011; MacDorman & Ishiguro, 2006). Prior research has found inconsistent realism in an entity's features, such as eyes and voice, increases reported eeriness (MacDorman et al., 2009; Mitchell et al., 2011).

The realism inconsistency theory (MacDorman & Chattopadhyay, 2016) predicts viewers will experience cold, eerie feelings when perceiving anthropomorphic entities that have features at different levels of realism. An object that is designed to appear human but fails to be indistinguishable from human in every feature is likely to have features that are inconsistent in their level of realism, because any discrepancy from human was unintended and thus beyond the designer's control. Therefore, computer-animated characters, or android robots, that are recognizable as such are inherently realism inconsistent. A potential source of uncanny feelings in perceiving an entity that possesses both human and nonhuman features is category prediction error, which could have several potential causes. Firstly, human morphological features elicit neurocognitive expectances of behavioural responses that align with human norms, these expectancies are then violated (MacDorman & Ishiguro, 2006). Second, the brain's categorizations of the entity's features conflict when they are integrated during the perception and recognition of the entity as a whole e.g. a living appearance coupled with coldness or stiffness in an embalmed body. Third, the human features may be processed by brain areas that are rapid, efficient, and specialized, such as the fusiform face area or the extra striate body area, while the nonhuman features may be processed by brain areas that are slower and more general; this results in competition among brain areas (James et al., 2015). Fourth, if some features are processed more rapidly than others, information flows that are typically integrated simultaneously in the perception of the whole entity could lag. And last, the 'overtraining' of neural networks for human face and body recognition through a lifetime of exposure to other people could sensitize them to even small deviations from human norms. Thus, based on the first to last, nonhuman imperfections in a human-like entity could elicit large feedback error signals. Keeris and Schmettow (2016) also proposed a new theoretical framework that tries to explain the impact of category confusion on the uncanny valley. They hypothesised that there is a fast and early evaluation stating whether the observed stimulus is a human face or not a human face. This process contains a few steps. The first is to recognise is the face is human or not, then the system fires off an answer after which the primary emotional response is experienced, which makes the upward slope. This is followed by a deeper inspection, and they propose that category confusion takes place somewhere between the initial categorisation and the deeper inspection. During this deeper inspection, conflicting information builds up as it is a cumulative process. The observer starts to notice the small differences that make the stimulus seem not as human-like as thought during the initial evaluation. The more salience the face has towards non-human-likeness, the faster the conflicting information builds up. The accumulated emotional response during deeper inspection only occurs if category confusion does take place. If there turns out to be no confusion on the category of the stimulus, the entire emotional asset of category confusion becomes non-existent because the participant proceeds to stick with their initial categorisation. When a stimulus is initially categorised as a human face, even though it is clearly not, the category of said stimulus turns over, leading to negative judgment. The stronger the confusion, the more negative the response would then be. They further mention that the important point is the category turnover, which means that, if the process is cut off before the cumulative information has reached a critical point, the trough never happens. The critical point of information accumulation depends on the details of the stimulus. Consequently, the longer the deeper inspection takes, the more likely a change of category will take place.

Current research

An experiment will be set up to investigate if the results on the processing of human faces are also applicable to the formation of a judgment of uncanniness of artificial faces. It will be examined how long people need to judge the level of eeriness for an artificial face, by comparing the eeriness ratings of stimuli for different types of exposure length. In comparison to Moll and Schmettow (2015), who did comparable research on the topic, this research will be conducted with images ranging from 0 – 100% human likeness, instead of 70 – 90%. This is needed to see the impact of different exposure times on the uncanny valley trough. This way we can see if the effect is less pronounced or even disappears with shorter exposure times and/or if it shifts along the human-likeness axis. The research question aimed to answer with this experiment is: “What is the impact of category confusion and shorter exposure times in the presentation of robot faces on how the position and depth of the trough of the Uncanny Valley phenomenon changes?”

In short, this is a meant to be a replication study of the research done by Mathur and Reichling (2016), focussing more on the effects of category confusion and shorter exposure times. The presentation times will increase from a minimum of 50ms and finally to a maximum of 2s presentation time. The degree of human likeness of the stimuli will be varied, a set of stimuli from the research of Mathur and Reichling (2016) will be used in this experiment, with 16 added images in the 70-90% human likeness for better representation of this area. The previous researches used either a small section of the human-likeness scale in their experiment, averaged the data for all participants so you cannot conclude anything on individual level or did not use fast and slow presentation time in one experiment. A second goal is to replicate Keeris and Schmettow (2016), with the added stimuli around the expected uncanny valley trough area for higher certainty. This replication is to see if a shift, in the position and/or depth of the uncanny valley trough appears. The reason to find shifts is to see how people react to the presentation of robot faces in different times, so to see if and how category confusion impacts the uncanny valley. The third goal is to see if the characteristic uncanny valley curvature is generalizable for individual participants. When using the individual data gathered, we can see if the characteristic uncanny valley curvature is there for all participants in all conditions. We also avoid an interaction effect between the participants, because we look at the data per individual.

Firstly, it is hypothesised that participants are able to provide the uncanny valley phenomenon's characteristic curvature in a condition with short presentation times. Secondly, it is hypothesised that we find a characteristic uncanny valley curve with all the individual participants. It is also hypothesised that there is a clear shift of the uncanny valley trough position from higher human-likeness towards lower human-likeness when the presentation times get shorter. Furthermore, it is hypothesised that there is a clear shift of the uncanny valley trough depth towards lower eeriness when the presentation times get shorter. As last, it is hypothesised that, when less information becomes available in shorter stimuli presentation, the participant's certainty about categories decreases. It becomes less likely that a participant recognises the deviating (mechanical) features of the face. In consequence, category confusion starts to happen for more mechanical faces. The reverse is then also hypothesised, when more information becomes available in longer exposure times, the participant's certainty about categories increases. It becomes likelier that a participant recognises the deviating (mechanical) features of the face. The consequence, category confusion starts to happen for more human-like faces. It is presumed that, in longer exposure times you form more ideas and expectations, e.g. gender, character of the person, likeability.

Method

Participants

Our sample consisted of 39 participants (20.5% male, 79.5% female) with an average age of 20.28 years (SD = 2.035; 16 – 29). From our sample, 24 participants were native German speakers, 11 participants were native Dutch speakers. The remaining 4 participants performed the experiment in English. All participants of this study were students of the University of Twente. Participants either received credit points in exchange for their participation (36 participants) or participated voluntarily without receiving any benefits (3 participants). All participants confirmed to take part in our study based on their free will by signing an informed consent. The study was approved by the ethical committee of the Faculty of Behavioural Sciences of the University of Twente.

Materials

The experiment was conducted in one of the laboratory rooms at the University of Twente. The room was approximately $4m^2$, containing a chair and a desk where the computer and monitor were located. The chair was placed in front of the desk so that participants were distanced approximately 75cm to the screen that was used for stimulus presentation. The computer used for our experiment included an Intel Core Pentium P6000 CPU and 3GB of RAM with Windows 10 x64 as operating system. The monitor used for stimulus presentation was an LG E2210, which has a refresh rate of 60Hz and a response time of 5ms. A standard mouse and keyboard were used as input devices. To program and run our experiment, we made use of the software PsychoPy v1.84.2. The experiment used the same sample of 80 real-world robot faces from Mathur and Reichling (2016), with 16 additional real-world robot faces.

Design

In this experiment, we made use of a repeated measures design where each participant rated the same stimulus on three different occasions, each time with a different presentation time. The independent measure in our experiment was therefore the presentation time of the stimulus. We used presentation times of 50ms, 100ms, 200ms and 2s. The dependent measure was the rating of eeriness that participants gave after the stimulus was presented to them.

Stimuli

To investigate what processes are responsible for uncanny valley phenomena, we incorporated stimuli with a varying degree of human likeness, previously gathered by Mathur and Reichling (2016). By incorporating a great number of stimuli with varying degrees of human likeness, we tried to ensure that the number of stimuli that actually fall into the uncanny valley is high. The experiment used the same sample of 80 real-world robot faces as in Mathur and Reichling (2016) that embodied the myriad design choices made by actual robot designers, choices that may be subtle and unexpected and may vary depending on whether the designer's intention is to build more mechanical versus more human-like robots. The size of the sample and its diversity in mechano-humanness enabled a fine-grained statistical analysis of the effect of mechano-humanness on human social perceptions. To reduce bias in selecting the robots or their manner of presentation (expressions, poses, viewing angles, background settings, etc.), they conducted a systematic search using specific inclusion and exclusion criteria. They performed four Google image searches on a single day using the following sets of search terms: ‘‘robot face,” ‘‘interactive robot,” ‘‘human robot,” and ‘‘robot.”

Inclusion criteria were:

1. Full face is shown from top of head to chin.
2. Face is shown in frontal to 3/4 aspect (both eyes visible).
3. The robot is intended to interact socially with humans.
4. The robot has actually been built.
5. The robot is capable of physical movement (e.g., not a sculpture or purely CGI representation that lacks a three-dimensional body structure).
6. The robot is shown as it is meant to interact with users (e.g., not missing any hair, facial parts, skin, or clothing, if these are intended).
7. The robot represents an android that is plausibly capable of playing the wagering game (e.g., not a baby or an animal).
8. The resolution of the original image (or an exact copy when one could be located) is sufficient to yield a final cropped image at 100 d.p.i. and 3 in. tall.

Exclusion criteria were:

1. The robot represents a well-known character or a famous person (e.g., Einstein).
2. The image includes other faces or human body parts that would appear in the final cropped image.
3. Objects or text overlap the face.
4. The robot is marketed as a toy.

When the search returned multiple images of a particular robot, they accepted only the first image encountered; if an image failed only graphical criteria, they accepted the next graphically adequate image of the same robot. They accepted the first 80 face images satisfying inclusion criteria and cropped them to include top of head to bottom of chin (or when those features were missing, images were similarly framed in approximate proportion to the features).

Also next to this set of images, self-found images using the terms "humanlike robot" and "human face robot", concurring with the in – and exclusion criteria handled by Mathur and Reichling (2016) were added to the stimuli dataset to further maximize the number of faces in the 70-90% human likeness scale. This way more data can be collected on the part of the graph where the trough usually presides. The faces were inter-rater reliability tested by the researchers Slijkhuis and Schmettow and the mean of the two ratings were taken to determine the eventual human-likeness rating of the face.

Task

Participants were presented with one stimulus at a time that was set in the centre of the screen. The stimulus presentation started with 500ms where only a black screen was visible, followed by a fixation cross that was also presented for 500ms. After the fixation cross, the stimulus was presented for either 50ms, 100ms, 200ms and 2s depending on the stage of the experiment. After the stimulus presentation, a mask was presented. The mask was used to induce a conflict in the perception of the stimulus. The processing of the first pattern (the stimulus) is interrupted by the second pattern (the mask) before the first pattern is fully processed. It therefore enables us to reduce the amount of higher level processing that takes place after stimulus presentation and should therefore result in responses that are influenced by processes that take place while the stimulus is actually presented and reduce effects of processes taking place after stimulus presentation. When the mask faded, participants rated the eeriness of each stimulus via a visual analog scale. The mouse was used as an input device for the rating, and participants were able to set their judgment anywhere on the scale, not just on whole numbers, but also between two points of the scale (e.g. 2.4 instead of 2 or 3). A flowchart that depicts the sequence of events is displayed in figure 2. The experiment was divided into smaller blocks of 32 stimuli. Each time one of these blocks was completed, there was a 20 second break to give participants some time to rest. This was included to make sure that the participants stayed concentrated over the course of the experiment, it may be possible this time varied between and within participants for the reason of freedom as of when to continue. In total, 288 stimuli were used in our experiment, meaning there were 3 blocks per time condition. With all four time conditions combined, a total of 11.232 ratings were collected in our experiment. The presentation times increased over the course of the experiment, meaning that each stimulus was first rated on the shortest presentation time, before increasing to the following longer presentation times. This order of presentation times from shortest to longest presentation time was chosen to reduce the effect of mere exposure. If participants have already seen a stimulus in a long presentation time, this could have an influence on ratings for the same stimulus with a very short presentation time.

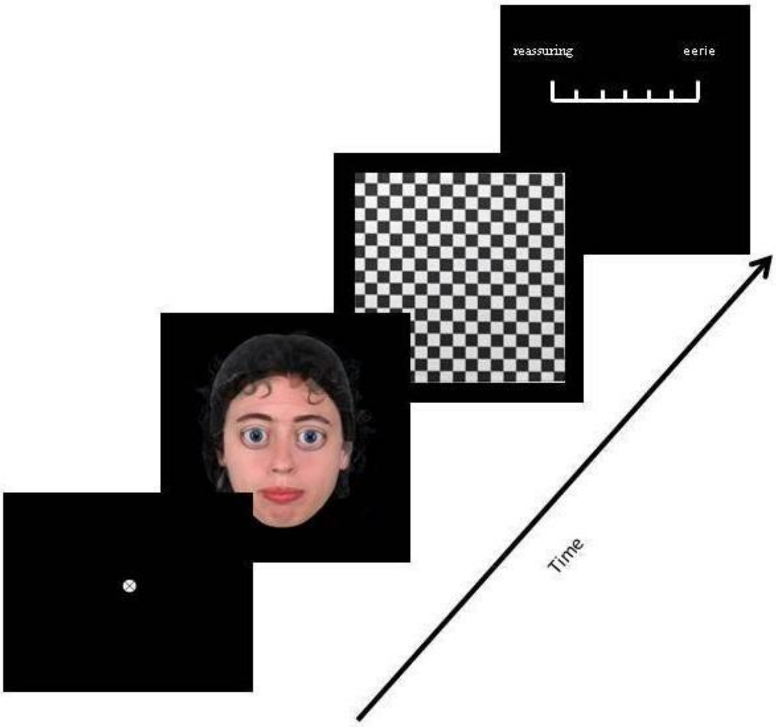

Figure 2. Flow chart of a stimulus as presented in this experiment.

Procedure

Participants sat down in the experimental room and were given an informed consent form. After agreeing to the informed consent, they were handed a written instruction that included information about the motivation and the goal of the study. When participants finished reading the introduction, they were given the opportunity to ask questions before the experiment starts. At the start of the experiment, participants completed 1 test trial of 5 stimuli. This trial was included so that participants could practice how to respond to the stimuli, before the actual experiment started. A researcher was present during those practice trials to answer possible questions about the functioning of the experiment. After finishing the practice trial, the researcher left the room and participants completed the experiment. When the experiment was finished, participants were given further opportunity to ask any open questions before leaving.

Ratings

The scale participants used to rate the stimuli was a questionnaire by Ho and MacDorman (2010), specifically the scale that measures the eeriness construct. This scale consists of eight different items measuring to what extent participants consider a stimulus as eerie. This scale was preferred for our research because alternative measurement instrument, such as the Godspeed Index (Bartneck, Kulić, Croft, & Zoghbi, 2008), that were used in similar experiments were not suitable. The Godspeed Index used five different indices (anthropomorphism, animacy, likeability, perceived intelligence, and perceived safety) to evaluate reactions to artificial characters. However, Ho and MacDorman (2010) judged this scale as unsuitable for investigating the uncanny valley due to none of these indices specifically corresponding to eeriness, a dimension that cannot be ignored when evaluating whether an artificial stimulus lies within the uncanny valley or not. They also criticised the indices themselves, stating that in the development of these indices there had been no attempts of making them de-correlate from positive (vs. negative) affect or even from each other. The eeriness index of the scale used in this study, however, is de-correlated from the humanness, warmth, and attractiveness indices developed by Ho and MacDorman (2010). The original questionnaire by Ho and MacDorman (2010) is in English. However, we provided translations of the scale in both Dutch and German to pre-emptively prevent any misunderstandings due to a potential language barrier. The items of the original scale were translated from English to Dutch and German by a native speaker of the respective language, after which this translation was then given to another native speaker who in turn translated it back to English (see Appendix A for an overview of all original items and their translations). This way we minimised the possibility of faulty or inconsistent translations. The item-stimulus pairing was randomly selected for each participant, resulting in ratings for all eight items on the scale.

Item-stimulus pairing

The program required to run the experiment randomly paired each stimulus to one of the eight possible items from the scale. The coupling remained during the participant session, meaning each stimulus was paired with the same item in all conditions. Consequently, each participant rated a specific stimulus on the same item for both of the presentation times. While the item-stimulus pairing was set as soon as the experiment began, the order in which the stimuli were presented was not. This means that a stimulus presented early in the 50 ms condition could be presented in the middle or at the end of the 5 second condition. This lack of ordering minimised any order effects that could potentially affect the study results.

Statistical analysis

For our regression analysis, we start with the same model as Mathur & Reichling (2016), using a third degree polynomial on averaged data:

$$\mu_i = \beta_0 + \beta_1 x_i + \beta_2 x_i^2 + \beta_3 x_i^3$$

A first-degree polynomial is the grand mean model, with β_0 as a constant, the intercept. A second-degree polynomial is the linear model. By adding higher degrees, we can introduce curvature to the association. This is the reason for the use of a third-degree polynomial.

In the later analysis, we will estimate the trough of the UV curve as this is the most characteristic point of the function. It denotes where participants have the strongest feelings of eeriness. In appendix B, we define a function to compute the lowest stationary point (the trough) of third degree polynomials.

Now, the non-averaged data is analysed, where we have repeated measures. The model builds on the previous polynomial model, but adds participant-level random effects (as well as item-level and stimulus-level). Practically, this means that individual polynomials are estimated, with one per participant. In result, we can describe individual differences in UV sensitivity.

Next, the fixed effects, which reflects the population-level, were computed. We expect that the effects are similar to those obtained by averaging over participants.

Random effect and fixed effects parameters are part of a linear model, which is why we first have to extract the posterior distributions for fixed and random effects separately. Then we sum fixed effects and participant-level random effects to get the polynomial coefficients per participant. From that we derive the participants' troughs. All transformations are performed on posterior samples. Point and interval estimates are computed at the very last step. For the analysis, we only look at participants who completed the 100ms as shortest condition.

Results

Exploratory data analysis

Mathur and Reichling (2016) examined the uncanny valley phenomenon on population level, meaning that first all responses are averaged over participants. Averaging polynomials is a bad idea when participants differ in how they respond to the stimuli. In previous studies, we have seen strong variation in participants' response patterns, so this can be an issue. With a random effects analysis, we can estimate a polynomial curve per participant (see appendix C). We will see multiple curves per participants and our question of interest is mainly if the Uncanny Valley generalises over all participants. In figure 3 we can see multiple curves. These curves represent the different conditions in which the participants have rated the stimuli. The horizontal axis is the huMech scale, which is comparable to the human-likeness and the vertical axis is the response on the eeriness scale. The curves should show a characteristic uncanny valley curvature in the conditions. We will try to find out if there are uncanny valley curvatures with the data gathered in this experiment. We are especially interested in the shorter exposure times, to see if something changed compared to longer exposure times.

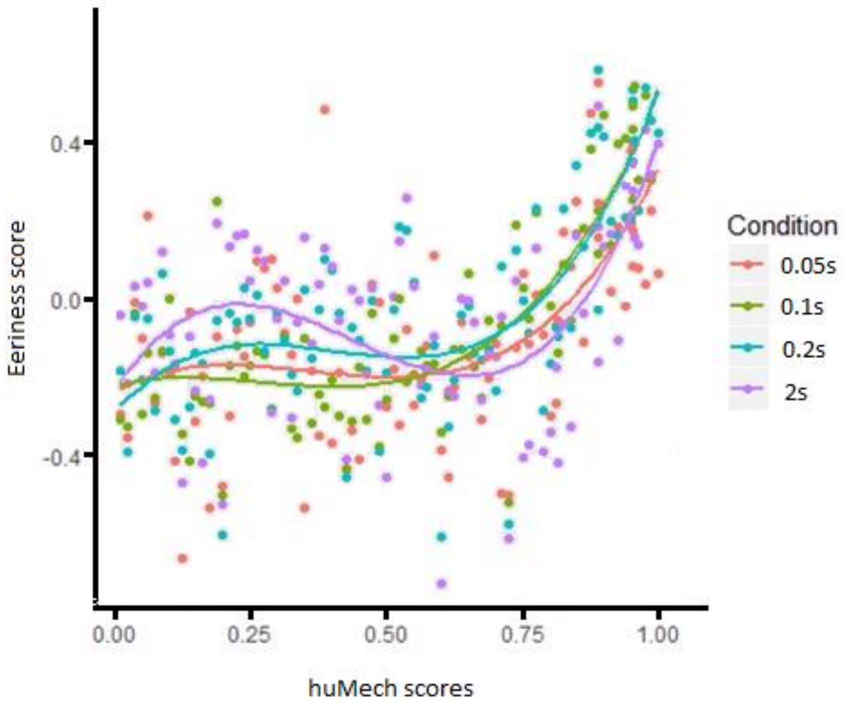

Figure 3. Averaged curves of all participants for all conditions. The x-axis are the huMech scores, which is the human-likeness of the presented robot faces, with 0 as not human-like and 1 as human-like. The y-axis are the emotional responses, for the robot faces, of the participants on an eeriness scale, with lower scores meaning higher eeriness felt from a face. The conditions are presentation times of the robot faces in seconds.

When looking at figure 3 we can see that, when responses are averaged, the trough for the 2s condition is the most defined one to the right, towards higher huMech scores and rated almost the same in eeriness as the 0.05s condition when analysed visually. The 0.2s and the 0.05s condition troughs are visually almost on the same hu Mech score, but the 0.2s through has a lower eeriness rating. The trough of the 0.1s condition is the one most to the left, towards the lower huMech scores, with the highest eeriness of all the conditions.

When looking at the individual graphs, the first thing that is noticed is that there are many characteristic uncanny valley looking curves, but with some deviation between the participants. This is noticeable with trough depth and placement, and even curves without a through. In total, there are 24 participants that have a characteristic curve in all 3 conditions, 5 (55.56% in the total of 9) with 50ms as first condition and 19 (63.33% in the total of 30) with 100ms as first condition. It can be seen that all participants have some form of a characteristic uncanny valley curve for the 0.1s, 0.2s and 2s conditions. However, they do differ in placement and depth between the participants.

When looking at the participant group with 50ms as first condition, we can see a difference in almost all the conditions between the participants. Most of the participants do show a curve that can be seen as a characteristic uncanny valley curve. In this condition 5 participants (e.g. 7, see figure 4) had characteristic curves in their 50ms curve.

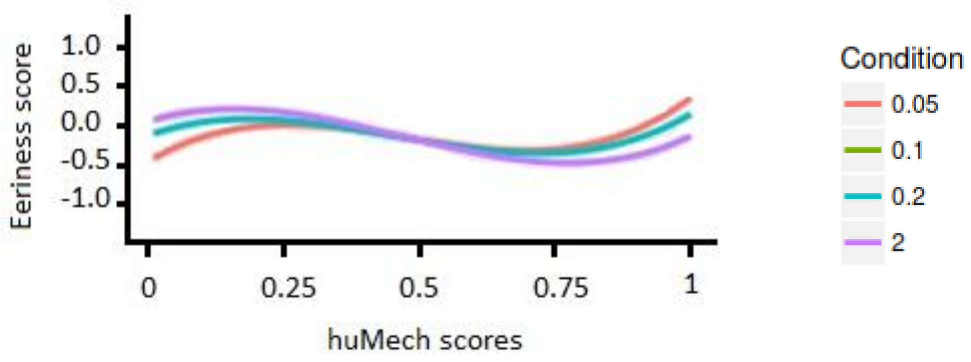

Figure 4. Individual graph of participant 7 with very defined curves in all conditions. For explanation of terms, see fig. 3.

Other participants (1, 3, 4, 8, 9) had less defined curves in the 50ms condition, with participant 8 even having a flat curve for 50ms (see figure 5). Participant 3 showed flat curves in all the conditions.

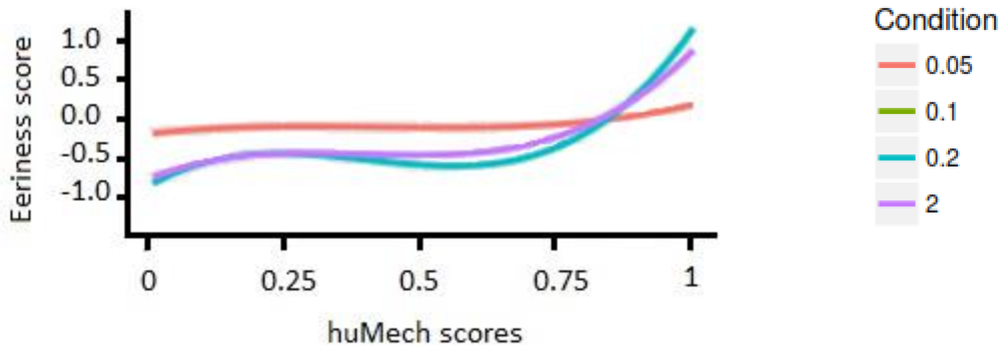

Figure 5. Individual graph of participant 8 with a flatlined curve in the 50ms condition. For explanation of terms, see fig. 3

When looking at the participants with the 100ms as first condition, there are, again, a lot of individual differences. There are three participants (19, 26, 39, see figure 6) that have visual effects in their curves. However, participants seem to differ in how much they use the full range of the rating scale, this could be caused due to a response style bias.

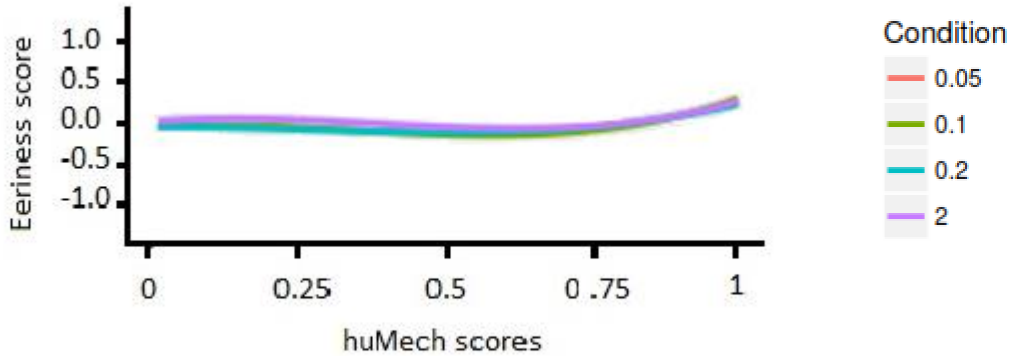

Figure 6. Individual graph of participant 19 with a flattened curve around 0 eeriness. For explanation of terms, see fig. 3

It is also visible in the curves of most participants, that the higher the presentation time the more the through moves to the right, higher up the huMech scale. As for the depth of the trough, it is very difficult to distinguish the differences for within and between the individuals. But visually it seems that, with most participants (e.g. participant 20, see figure 7), the depth of the trough gets deeper with higher presentation times, but this differs between participants.

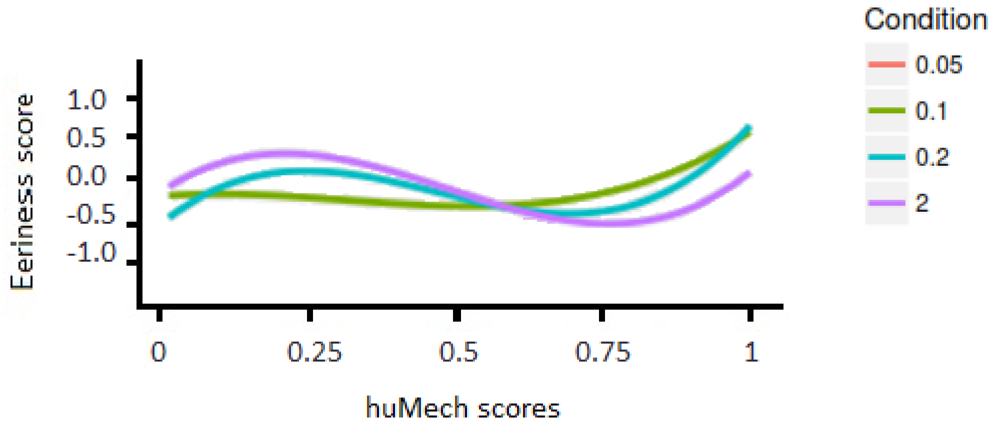

Figure 7. Individual graph of participant 20 with three identifiable curves. For explanation of terms, see fig. 3

The prevalent pattern is that the Uncanny Valley trough, for within participants, shift to the higher huMech scores when the presentation times get longer. The Uncanny Valley curvature is always visible in the 2s condition and practically always visible in the 0.1s and 0.2s conditions. With shorter presentation times, there is a tendency for the trough to move towards the lower huMech scores, but nothing can really be said about the depth of the troughs in the different conditions. Overall, participants differ between conditions, in where the trough can be found on the huMech scale and in the form of the curvatures. However, it can be said that the characteristic curves can be found in all three conditions for all participants.

Regression Analysis

A first-degree polynomial is the grand mean model, with ß0 as a constant, the intercept. A second-degree polynomial is the linear model. By adding higher degrees, we can introduce curvature to the association. Due to the curved shape of the uncanny valley, linear regression is not applicable. Instead, we applied a third-degree polynomial. Mathur and Reichling (2016) argue that the Uncanny Valley curve possesses two stationary points, where the slope is zero. One is a local minimum and represents the deepest point in the valley, the trough and the second is a local maximum and marks the peak left of the valley. Such a curvature can be approximated with a third-degree polynomial function, which has a constant β_0, a linear slope β_1, quadratic parameter β_2 and a cubic parameter β_3.

We start with the same model as Mathur and Reichling (2016), using a third degree polynomial on averaged data:

$$\mu_i = \beta_0 + \beta_1 x_i + \beta_2 x_i^2 + \beta_3 x_i^3$$

The first step, to build a regression, is to add variable x to the function. For better clarity, we rename the intercept to be β_0. We can extract the fixed effects table (see table 1).

Table 1

Estimates of fixed effects across all coefficients for each condition (presentation time in seconds)

Condition	ß0	ß1	ß2	ß3
Condition0.05	-0.23	0.73	-2.54	2.29
Condition0.1	-0.26	0.57	-1.99	2.35
Condition0.2	-0.30	1.64	-4.56	3.82
Condition2	-0.26	2.49	-7.13	5.32

The four coefficients specify the polynomial to approximate the average eeriness responses. They have little explanatory value, because neither of the parameters alone relates to a relevant property of the uncanny valley. However, there is a pattern to be seen. The intercept becomes more negative when the shorter times exposure times get longer, but when the exposure time is long (i.e. 2s), then the intercept becomes slightly less negative. The relevant property we are interested in would be the location of the deepest point of the uncanny valley, its trough. The trough is a local minimum of the curve and with polynomial techniques, we can find this point.

Finding the local minimum is a two-step procedure. First, we must find all stationary points, which includes local minima and maxima. Then, we determine which of the resulting points is the local minimum. Stationary points occur, where the curve bends from rising to falling, or vice versa. They are characterised by having a slope of zero, so neither rising nor falling. Stationary points can be identified by the derivative of the third-degree polynomial, which is a second-degree polynomial:

$$\mu_i{}' = \beta_1 + 2\beta_2 x_i^1 + 3\beta_3 x_i^2$$

The derivative of our third-degree polynomial function gives the slope of μ_i at any given point x_i. When $\mu_i' > 0$, μ_i is rising at x_i, with $\mu_i' < 0$ it is falling. Stationary points are the points, where $\mu_i' = 0$ and can be found by solving the equation. The derivative of a third-degree polynomial is of the second degree, which one variable that is quadratic. This can produce a parabolic form, which could hit point 0 twice, during rise and when falling. A rising encounter of point zero indicates that μ_i has a local minimum at x_i, a local maximum when falling. In consequence, solving $\mu_i' = 0$ can result in two solutions, one minimum and one maximum, which needs to be distinguished further. If the stationary point is a local minimum, as the trough, slope switches from negative to positive (i.e. μ_i' crosses $x_i = 0$ in a rising manner), which is a positive slope of μ_i'. Therefore, a stationary point is a local minimum, when of $\mu_i'' > 0$. In table 2 we can see an overview of the depth and position of the trough per condition used in our study and credibility intervals each one.

Table 2

The averaged trough position and depth for each condition with credibility intervals

parameter	Condition	center	lower	upper
Depth	0.05s	0.00	-0.26	0.25
	0.1s	0.01	-0.22	0.18
	0.2s	-0.14	-0.33	0.06
	2s	-0.04	-0.22	0.16
Position	0.05s	0.56	0.28	0.66
	0.1s	0.42	0.26	0.56
	0.2s	0.56	0.40	0.63
	2s	0.66	0.60	0.70

With this procedure, there is an issue. Drawing on the center estimates, which is a summary of the posterior distribution, we get a point estimate only. Statements on certainty are impossible, as a confidence interval is lacking. Every posterior distribution contains simultaneous draw of the four huMech parameters, and therefore fully specifies its own third-degree polynomial. A posterior distribution for the trough can be obtained by performing the above procedure on every participant separately.

So, using the previous polynomial model, a new model was constructed by adding participant-level random effects (as well as item-level and stimulus-level) to analyse the non-averaged data. This means that individual polynomials are estimated, one per participant. In result, we can describe individual differences in Uncanny Valley sensitivity. Random effects and fixed effects parameters are part of a linear model, which is why it was needed to extract the posterior distributions for fixed and random effects separately. Then we summed fixed effects and participant-level random effects to get the polynomial coefficients per participant. From that we derived the participants' troughs. Point and interval estimates were computed at the very last step. For the analysis, we only look at participants who completed the 100ms as shortest condition. The table (Appendix D) shows the summary for all participants. The parameters represent the individual polynomial coefficients, from which the position and depth of the trough has been derived.

When performing a within-subject analysis for position of the three conditions, it can be seen that the longer the presentation times of the stimuli, the more the trough moves to the right, towards the higher HuMech scores. The first condition, 0.1s, has the average trough at 0.457, 95% CI [0.421, 0.493], SD = 0.097. As we can see for the first condition, the mean is low, which means that the participants rated the faces the eeriest towards the lower HuMech scores. The credibility interval is small in this condition and the standard deviation of the random effect is low, which means that the individual data is very centred around the average trough. The second condition, 0.2s, has the average trough at 0.565, 95% CI [0.525, 0.606], SD = 0.108. As we can see for the second condition, the mean is higher than in the 0.1s condition, which means that the participants rated the faces the eeriest more towards the higher HuMech scores than in the 0.1s condition. The credibility interval is slightly wider than in the 0.1s condition and the standard deviation is also higher than in the 0.1s condition. The third condition, 2s, has the average trough at 0.654, 95% CI [0.628, 0.680], SD = 0.070. As we can see for the second condition, the mean is higher than in the other conditions, which means that the participants rated the faces the eeriest even more towards the higher HuMech scores than in the 0.2s condition. The credibility interval is smaller than in the other conditions and the standard deviation is also smaller than in the other conditions. For all conditions the $p < .001$, partial $\eta^2 = 0.789$.

When the data is used to make a caterpillar plot, see figure 8, it is visible that there is a transition, from the 0.1 to 2s conditions, towards higher huMech scores. It can also be seen that the credibility becomes higher when the presentation time gets longer.

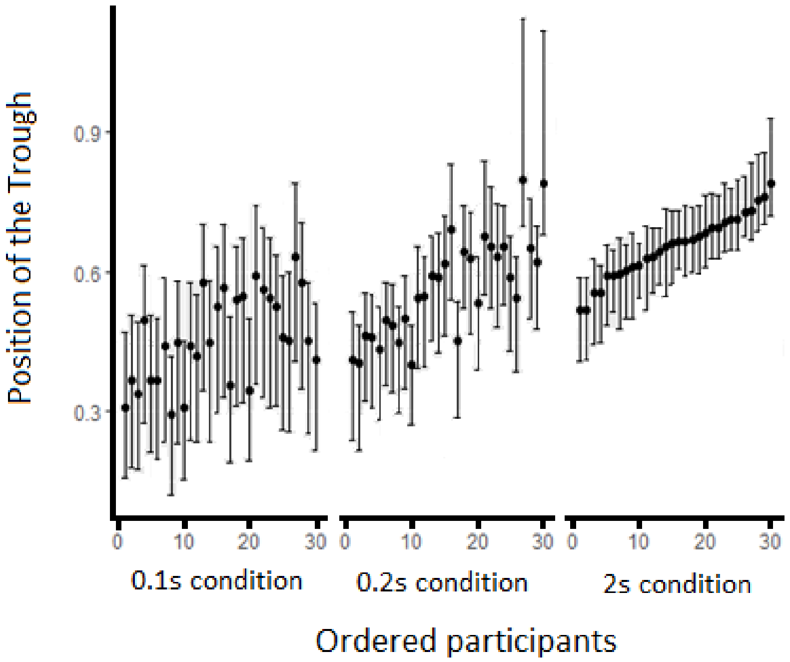

Figure 8. Caterpillar graph of sorted individually distributed throughs of participants in the three conditions.

To see this shift of the position of the trough more clearly for each participant, we plot the shift by condition of the trough for individual participants (see figure 9). It shows a clear shift to the right from 100ms to 2s. Almost all have a monotonous right shift when presentation times get longer.

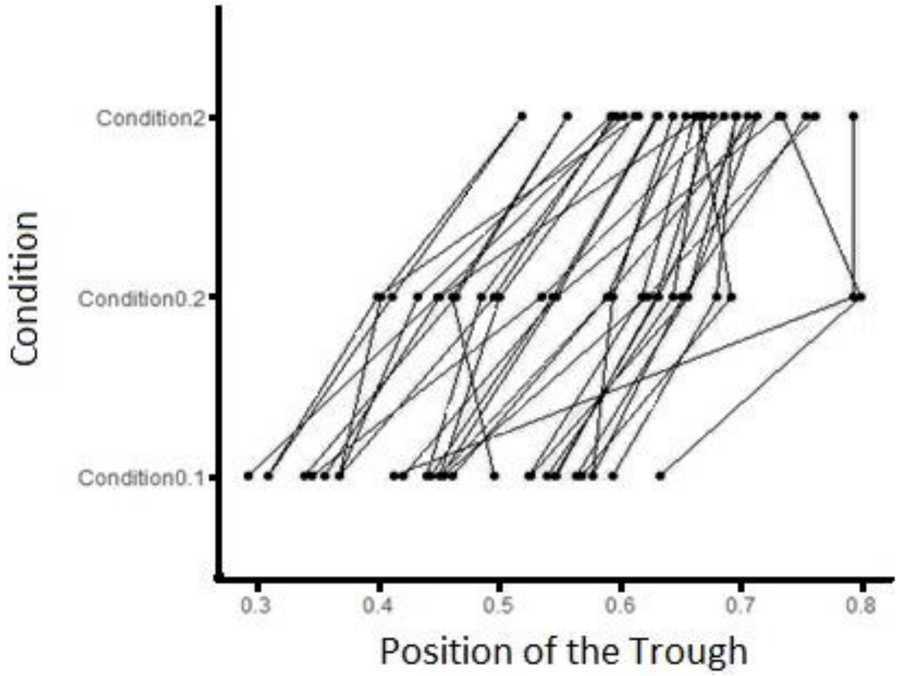

Figure 9. Shift graph of the position of individually distributed throughs of participants in the three conditions.

When performing a within-subject analysis for depth of the three conditions, it can be seen that there is no real observable effect. The first condition, 0.1s, has M = 0.023, 95% CI [0.017, 0.029], SD = 0.016. As we can see for the first condition, the mean is positive, which means that the participants rated the faces as not eerie in this condition. The confidence interval is very small in this condition and the standard deviation is also low. The second condition, 0.2s, has M = -0.092, 95% CI [-0.124, -0.060], SD = 0.087. As we can see for the second condition, the mean is negative, which means that the participants rated the faces eerier in this condition than in the 0.1s condition. The confidence interval is wider in this condition than in the previous condition, but it is still small. The standard deviation is bigger than in the 0.1s condition, but is also low. The third condition, 2s, has M = -0.025, 95% CI [-0.094, 0.0430], SD = 0.183. As we can see for the first condition, the mean is also negative, the participants rated the faces eerier in this condition than in the 0.1s condition, but less eerie than the 0.2s condition. The confidence interval is wider in this condition than in the other conditions. The bounds are centred around 0 eeriness, with the lower bound being negative and he upper bound being positive. The standard deviation is bigger than in other conditions. For all conditions the F (2, 58) = 10.021, $p < .001$, partial $\eta^2 = 0.257$.

To see this shift of the depth of the trough more clearly for each participant, we plot the shift by condition of the trough for individual participants (see figure 10). It does not show a clear shift from 100ms to 2s. We can see that that the variance gets larger when the presentation times get longer.

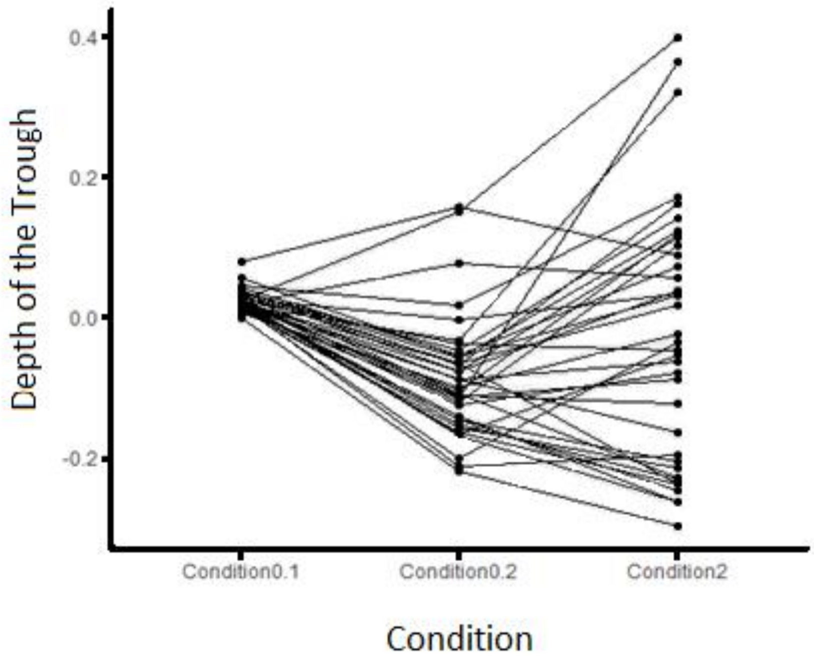

Figure 10. Shift graph of the depth of individually distributed throughs of participants in the three conditions.

Discussion

Research goals

With this experiment, we had several goals in mind. First, we aimed to replicate the study by Mathur and Reichling (2016) on the uncanny valley effect. They managed to capture the uncanny valley curvature by presenting mechanistic faces ranging from very robot-like, to faces with a high degree of human-likeness. In order to replicate their results, we used their full stimuli set, but added more human-like robot faces to get more stimuli around the expected trough area of the phenomenon, which could have been seen as a limitation of their study. Limitations of previous studies were also tried to be taken into account in this experiment, i.e. using fast and slow presentation times within participants and the use of the full range of robot faces from 0% human-likeness to near human-likeness.

A second goal was to replicate the study done by Keeris and Schmettow (2016), but with the full Mathur and Reichling (2016) stimuli data set and the added stimuli around the expected uncanny valley trough area for higher certainty. This replication was also to see if a shift, in the position and/or depth of the uncanny valley trough would appear. The reason to find shifts is to see how people react to the presentation of robot faces in different times, so to see if and how category confusion impacts the uncanny valley.

The third goal was to see if the characteristic uncanny valley curvature is generalizable for individual participants, in short if we can see the characteristic uncanny valley curvature with all the participants. This was made possible with the use of participant-level random effects in the data analysis to look at individual differences in uncanny valley sensitivity.

Research findings

For our first research aim we wanted to replicate the study by Mathur and Reichling (2016) while expanding upon it. One of these expansions was the addition of conditions with short presentation times in order to give a better idea of the depth of cognitive processing.

Mathur and Reichling (2016) managed to capture the uncanny valley curvature by presenting mechanistic faces ranging from very robot-like to faces with a high degree of human-likeness. In order to replicate their results, we used their full stimuli set and added 16 self-found faces, using their in- and exclusion criteria, to the stimuli set, which was the second expansion. Our results have shown that we were able to see and replicate the uncanny valley effect in two short and one long condition. This is both in line with prior research (e.g. Haeske, 2016; Keeris & Schmettow, 2016; Moll & Schmettow, 2015) and with our initial hypothesis. This was an expected result because other results on the uncanny valley show that it is most likely explained by the fast and automatic processes (MacDorman et al., 2009). A similar study to this one by Moll and Schmettow (2015) found that 50ms are enough to form a reliable judgment about the eeriness of a face. He suggests that the fear and disgust systems are involved in these rapid evaluations and provide strong evidence for the involvement of the fast system. Haeske (2016) also found the effects found by Moll and Schmettow (2015). Other studies on this have also shown that a short presentation time is enough to accurately categorise faces even if their presentation time is less than 50ms (Bar et al., 2006; Grill-Spector & Kanwisher, 2005; Stone et al., 2001). Therefore, it is not surprising that we were able to replicate the uncanny valley using short presentation times. However, some participants that performed an experiment with a 50ms condition failed to provide a curve with a visible effect. A difference was found between the participants of the two groups (50ms and 100ms as starting condition) in having a noticeable uncanny valley effect in their first condition. Relatively more people had difficulty categorising the robot faces in the 50ms condition than in the 100ms condition. There was a percental difference of 7,78% between the two participant groups (0.05s and 0.1s) for their first condition. This is interesting, because this could suggest a threshold of approximately 50ms for being able to categorise a face and therefore getting an uncanny feeling from the face.

In comparison to earlier research on this topic (e.g. Haeske, 2016; Keeris & Schmettow, 2016; Moll & Schmettow, 2015), this research was conducted with stimuli ranging the full scale of human likeness and specifically more at the expected trough area. This is needed to see the full impact of different exposure times on the characteristic uncanny valley effect. They (Haeske, 2016; Keeris & Schmettow, 2016; Moll & Schmettow, 2015) showed that people can feel eeriness from a CGI or android face as fast as 50ms. Even with more stimuli used for our experiment, as mentioned above, there were some individuals that could not provide this effect in 50ms, but almost all participants could provide this effect from 100ms onwards. The reason that the previous research found a characteristic effect in the 50ms condition and we could not, could be the fact that we looked at the participants individually and did not average the data.

A second goal was to replicate the study done by Keeris and Schmettow (2016), with the full Mathur and Reichling (2016) stimuli data set and the added stimuli around the expected uncanny valley trough area for higher certainty. The goal for this replication was to see if a shift, in the position of the uncanny valley trough, from higher huMech scores to lower huMech scores is visible when the presentation times become shorter. The other goal for this replication was to see if a shift, in the depth of the uncanny valley trough, from higher eeriness scores to lower eeriness scores is visible when the presentation times become shorter. Our results show a clear shift in the position of the trough. When the presentation times get shorter the trough of the curve moves towards the lower human-likeness score. This could be explained by category confusion theories. For example, the realism inconsistency theory of MacDorman & Chattopadhyay (2016) predicts viewers will experience cold, eerie feelings when perceiving anthropomorphic entities, e.g. robots, that have features at different levels of realism. When a person has a very short time to take in a human-like robot face, it is harder to distinguish these features. This means that when the presentation times are short the person would likely see the face as more human and less robot, leading to a less eerie rating of the face. Vice versa, when presentation times get longer, the person has more time to take in the face and would notice the distinguishable features more often, leading to an eerier rating of the face. This is also the case for the category confusion theory of Mathur and Reichling (2016). Both these theories try to explain the impact of category confusion on the eeriness rating of a face, which they do well, but they only present us with theories on why, not how. Keeris and Schmettow (2016) proposed a new theoretical framework that tries to explain the why and how. They proposed the following. First a person has to recognise if the face is human or not, then the system fires off an answer after which the primary emotional response is experienced, which makes the upward slope. This is followed up by a deeper inspection, and they propose that category confusion takes place somewhere between the initial categorisation and the deeper inspection. During this deeper inspection, conflicting information builds up as it is a cumulative process. The observer starts to notice the small differences that make the stimulus seem not as human-like as thought during the initial evaluation. They mention that the critical point of information accumulation depends on the details of the stimulus. Consequently, the more time the deeper inspection takes, the more likely a change of category will take place. Based on the workings of category confusion, they explained the shift of the trough to the left because that is where they found the negative ratings that are indicative of the uncanny valley. Taking this back to our results, you can see that this is indeed the case. In shorter times the robotic faces contain the trough and in longer presentation times the human-like robot faces contain the trough, which is the shift we found in our results. Our results do not show a clear shift in the depth of the trough, even though this was expected. The hypothesis was that the trough would be deeper in the longer condition (i.e. 2s) than in the shorter conditions (i.e. 0.1s and 0.2s). This was thought, because of the elongated time the person gets to notice the deviating features on the robotic face, which would cause a higher degree of eeriness.

The third goal was to see if the characteristic uncanny valley curvature is generalizable for individual participants in all the conditions used in this experiment. We created third-degree polynomials for all participants to see what would happen there. Then we analysed the individual curves, made from those polynomials, exploratorily. In this exploratory analysis, we found that for all 39 participants a characteristic curve of the uncanny valley effect was visible for the long condition (i.e. 2s condition). In the shorter conditions (i.e. 0.1s and 0.2s), most of the participants showed a characteristic uncanny valley curvature. The fact that some participants were not able to produce a characteristic curve, could be caused by individual differences or technical interference. Previous research, focussed on the characteristic effect on population level, with this research we did it on participant level. We also regard a conditional effect between the participants, because we use a multilevel model to look at individuals. What this shows is that the characteristic uncanny valley effect is found for every separate individual and is therefore an argument for higher generalizability of the uncanny valley phenomenon. Although we found the effect with each individual, it has to be mentioned that there is a wide range in where the effect takes place for the individuals (see figure 9).

Limitations

There is a limitation regarding the stimuli used for the replication of the study by Mathur and Reichling (2016). These faces showed variability in factors that could have influenced the way they were perceived. Proportions (Stirrat & Perrett, 2010), positioning (Mara & Appel, 2015), background setting (Winkielman, Schwarz, Fazendeiro, & Reber, 2003), gender (Bohnet & Zeckhauser, 2004; Buchan, Croson, & Solnick, 2008), resemblance to the viewer (DeBruine, 2002), and more, are all examples of these factors. One male participant told the researcher that he felt different towards the female robots opposite the male robots.

Furthermore, the faces were all found using a search on the Internet and as such may be a biased representation of the total possible range of robots (Mathur & Reichling, 2016). Factors such as intended audiences could be confounding variables of the relationship between the human-likeness of the faces and the responses of the participants.

Another limitation was the mere exposure effect. The presentation times increased over the course of the experiment, meaning that each stimulus was first rated on the shortest presentation time, before increasing to the following longer presentation times. This order of presentation times from shortest to longest presentation time was chosen to reduce the effect of mere exposure. If participants have already seen a stimulus in a long presentation time, this could have an influence on ratings for the same stimulus with a very short presentation time. Like we anticipated by presenting from short to longer, we likely reduced the mere exposure of the faces, but most participants said they recognized some faces from before, which means that there still could be, in part, a mere exposure effect. There is not really a way to fully stop the mere exposure when using the same faces in multiple sections with the same participant. One could argue that an experimental within-subject design, as used in this experiment, would be affected too much by this effect. This would mean that, if it were true for this experiment, the longer condition would be affected the most as it was presented last in the experiment for all participants. The effect that this would have would be a more positive rating (i.e. less eerie) for the 2s condition. The only thing that would happen because of this is that the characteristic uncanny valley curvature would move up on the eeriness axis, but should not change its form in any way. This means that the position of the trough will not change and only the depth of the trough could be slightly more positive.

The exclusion of the first 9 participants in the regression analysis can be seen as a limitation. The main problem with this was the fact that there were less participants tested in the conditions used for the regression analysis. It however led to an interesting finding in the exploratory analysis, suggesting a threshold of approximately 50ms. Mathur and Reichling (2016) used more participants in their study (n=342) where each participant received a selection of faces to judge. Each face was rated by 64 participants on average whereas in our study this was 30 times per condition. By adding the 16 extra faces in the expected area of the trough, we made the estimates more certain.

Some participants said that some of the words on the rating scale were not very clear and that they could not relate to them. They got a feeling because of the pictures, but the words on the rating scale did not describe their feeling for that picture and they thought it strange that they were not opposites in many cases. This could be a limitation, because the participants told the researcher that for some of the faces, they did not know where to rate them on the scale. Because of this hesitation, they sometime chose for a ranking at the middle of the scale.

The three not native German and Dutch speakers in the experiment were given the opportunity to perform the experiment in English, however this function was not available in our experiment, so the participants were given a paper with the translations from Dutch to English, whilst performing the experiment in Dutch and translating the words during the experiment. These participants took a little more time to complete the experiment, but all said it was not a problem and very much doable. Strictly these participants had to be excluded from the experiment. However, the fact that self-report scales can be vague, e.g. a questionnaire that distinguishes between participants' feelings towards robots, may not be able to identify the subtler differences between individuals and the range of feelings towards robots in the entire population, could mean that the effect the slightly different method had on the data is not very prominent. One example is the study of Mathur and Reichlin (2016), in which they used the simple question "estimate how friendly and enjoyable (versus creepy) it might be to interact with each face in an everyday situation". Ratings of likability showed little within-subject clustering, suggesting that individual subjects did not differ greatly to like robot faces in general.

Moreover, the use of translations might be a source of error. In order to eliminate language barriers as much as possible, the items have been translated from English to German and Dutch. This way the participants could perform the ratings in their native language. It was expected that participation in one's native language would eliminate language barriers and thereby yield the most accurate ratings. However, the downside of this approach is that the eeriness scale was translated. Peña (2007) describes translations as a source of error which might alter the original meaning of all kinds of material. In an attempt to reduce this threat, the backward translation technique was used to achieve a semantically identical Dutch and German translations of the questionnaire and the eeriness scale.

Impact for the future

There are some significant differences between the various versions of the uncanny valley that are used in literature. This makes it difficult to draw conclusions across studies, as these may vary based on trough position or stimulus type. These in turn differ based on what version of the valley is used for reference. This is an important factor to keep in mind, as it spans across all research on the uncanny valley. This is an area with much room for improvement. A recommendation for this would be to come to an agreement in what way the valley should be tested in future research, e.g. one kind of rating index or stimulus database. This way you can use the data and results from the different articles more freely.

Another recommendation is to use a rating index that uses more opposites. One thing that was noticed during this experiment was that a lot of participants found it bothersome that some of the items on the rating scale were not opposites of each other, which made it very counter intuitive to answer.

This experiment was performed in a lab environment with stimuli on a screen. It could be interesting to use real robots or let participants play a game in a laboratory experiment to be able to generalize the results better for actual real-life scenarios. This could provide different results, because the stimuli are more tangible.

Perhaps performing a study with a similar approach as the present study, but with more stimuli, a larger population to increase the certainty of the findings even more and a smoothing of the model used in this experiment. That study would then have a solid base to build up on and could be an even larger step towards generalizing the characteristic effect towards real life scenarios.

An implication of this research is the fact that we showed that the phenomenon is present for everyone, however with very broad personal differences in where the effect takes place (see figure 9). This could have an impact on how robot and game developers will design their products in the future. So, when looking at the data gathered in this experiment and looking at the longest condition (exposure in real-life will be of a longer exposure time) we can make a recommendation for the industry. The mean where the effect produces the highest eerie feeling takes place at a human-likeness of 65%. When taking that finding back to our stimuli, you can see that the face in figure 11 corresponds with 65% human-likeness.

Figure 11. A human-like robot on 65% human-likeness scale.

With this information, we suggest that the industry makes products and films that uses robots and characters above and/or below 65% human-likeness. The Polar Express, which did not perform well, probably used characters in this general vicinity. If you look at Wall-E, a big hit, they used a robot below 65% human-likeness.

Eventually, advancements in this field will have a great impact on the robotics and media of the future. Despite the uncertainty surrounding the uncanny valley, one thing is certain and that is the fact that these robots and characters will have more defined roles in future human life. Because of this we need to investigate this effect further to make the interaction between human and synthetic character as smooth as possible.

Conclusion

When we look at the main question we asked ourselves in the beginning, “What is the impact of category confusion and shorter exposure times in the presentation of robot faces on how the position and depth of the trough of the Uncanny Valley phenomenon changes?”. The shorter exposure times used in this experiment showed an impact on the position of the trough, it shifted from higher human-likeness towards lower human-likeness when the presentation times became shorter. However, it did not show an impact on the depth of the trough.
We can say, with the data and information we found, that category confusion has an impact on the uncanny valley, but it is difficult to say on what scale. It does explain the shift we found in the position of the trough in different conditions. It also explains that the depth should be deeper in longer exposure times, but this is something we did not find. Furthermore, our data showed us that the uncanny valley effect is present with all individuals, which means it is not conditional. However, there were individual differences found between the participants on where the trough could be found.

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Appendix A

An overview of all original items and their translations

English items		Dutch items		German items	
Anchor low	Anchor high	Anchor low	Anchor high	Anchor low	Anchor high
Reassuring	Eerie	Geruststellend	Griezelig	Beruhigend	Gruselig
Numbing	Feaky	Uitdrukkingsloos	Eng	Ausdruckslos	Unheimlich
Ordinary	Supernatural	Gewoontjes	Bovennatuurlijk	Gewöhnlich	Übernatürlich
Uninspiring	Spine-tingling	Zonder enthousiasme	Opwindend	Wenig begeisternd	Aufregend
Boring	Shocking	Saai	Schokkend	Langweilig	Schockierend
Predictable	Thrilling	Voorspelbaar	Spannend	Vorhersehbar	Spannend
Bland	Uncanny	Nietszeggend	Verontrustend	Nichtssagend	Beunruhigend
Unemotional	Hair-raising	Emotieloos	Doodeng	Emotionslos	Haarsträubend

Appendix B

We define a function to compute the lowest stationary point (the trough) of third degree polynomials.

```
## Finds the trough of the UV function (3d polynomial),
## if no exists in real space, it returns Na

trough <- function (coef, ...) {
   UseMethod("trough", coef)
 }

trough.numeric <-
    function(coef = c(-.2, -.5, .2, .7)) {
      if(length(coef) != 4) stop("the uncanny valley trough polynomial requ
ires exactly four parameters")
      poly <- polynomial(coef)
      dpoly <- deriv(poly)
      ddpoly <- deriv(dpoly)
      points <- solve(dpoly)
      pt_dir <- as.function(ddpoly)(points)
      if(!(any(is.complex(pt_dir)))){
        points[pt_dir > 0]
      }else{
        NA
      }
    }

trough.matrix <-
  function(coef) aaply(as.matrix(coef), .margins = 1, trough)

trough.data.frame <- function(coef) trough(as.matrix(coef))


# as.function(polynomial(c(-1, -2, -3, -4)))
# c <- c(-1,-2,3,4)
# m <- matrix(c(c, -.1,-.2,.3,.4), nrow = 2, byrow = T)
#
# class(c)
# class(m)
#
# trough(c)
# trough(m)


fn_uncanny <-
  function (coef, ...) {
   UseMethod("fn_uncanny", coef)
 }

fn_uncanny.matrix <-
```

```
  function(coef) {
    if(ncol(coef) != 5) stop("not the correct number of columns,
                             four coefficients and x required")
    coef[,1] +
      coef[,2] * coef[,5] +
      coef[,3] * coef[,5]^2 +
      coef[,3] * coef[,5]^3
  }


fn_uncanny.data.frame <-
  function(coef) {
    fn_uncanny(as.matrix(coef))
  }


fn_maxlike <-
  function(coef) {
    coef_1 = cbind(coef, 1)
    fn_uncanny(as.matrix(coef_1))
  }

## use this to beautify rstanarm parameter names from polynomial regression


recode_poly_par <-
  function(P){
    P_out <-
    P_1 %>%
      mutate(parameter = recode(parameter,
                                 "poly(huMech, 3)3"  = "huMech3",
                                 "poly(huMech, 3)2"  = "huMech2",
                                 "poly(huMech, 3)1"  = "huMech1",
                                 "Intercept" = "huMech0"),
             fixef = recode(fixef,
                                 "poly(huMech, 3)3"  = "huMech3",
                                 "poly(huMech, 3)2"  = "huMech2",
                                 "poly(huMech, 3)1"  = "huMech1",
                                 "Intercept" = "huMech0"))
    class(P_out) <- class(P)
    P_out
  }

str_recode_poly <-
  function(P) {
    P <- str_replace(P, "poly\\(huMech, 3\\)", "huMech")
    P <- str_replace(P, "Intercept", "huMech0")
    P
  }

recode_poly_par <-
  function(P){
    P_out <-
      P_1 %>%
```

```
      mutate(parameter = str_recode_poly(parameter),
             fixef = str_recode_poly(fixef))
    class(P_out) <- class(P)
    P_out
  }


swap_tweak<- function(P){
  P_out <-
  P %>%
  tidyr::extract(fixef,
                 into = c("par_poly"),
                 regex = "(huMech.)",
                 remove = F) %>%
  tidyr::extract(fixef,
                 into = c("Condition"),
                 regex = "(Condition[0-9\\.]+)",
                 remove = F) %>%
  mutate(#Condition = ifelse(Condition == "l", "long", Condition),
         #Condition = ifelse(Condition == "s", "short", Condition),
         fixef = if_else(type == "fixef",
                         str_c(Condition, par_poly, sep = ":"),
                         fixef))
  class(P_out) <- class(P)
    P_out
}

# trough.tbl_post <-
#   function(P){
#     P <- as_data_frame(P_1)
#     P_mat <-
#       P %>%
#       filter(str_detect(par_poly, "huMech")) %>%
#       select(iter, Condition, par_poly, value) %>%
#       spread(key = par_poly, value = value)
#   }
#   P_1 %>%  ## copying huMech0 to get a complete column set
#   filter()
#   bind_rows()
```

We start with a regression on average responses (over stimuli). As we have averaged over stimuli, we only have fixed effects.

```
F_1 <-
  formula("response ~ 0 + (huMech0 + huMech1 + huMech2 + huMech3):Condition
")

# F_1 <-
#   formula("response ~ 0 + poly(huMech, 3):Condition")

M_1 <-
  PS_2 %>%
  brm(F_1,
      family = gaussian,
```

```
      data = .,
      chains = 3, iter = 2000)

save(M_1, file = "M_1.Rda")
load("M_1.Rda")

P_1 <-
  posterior(M_1) %>%
  swap_tweak()

load("M_1.Rda")

T_1 <- fixef(P_1)
T_1
```

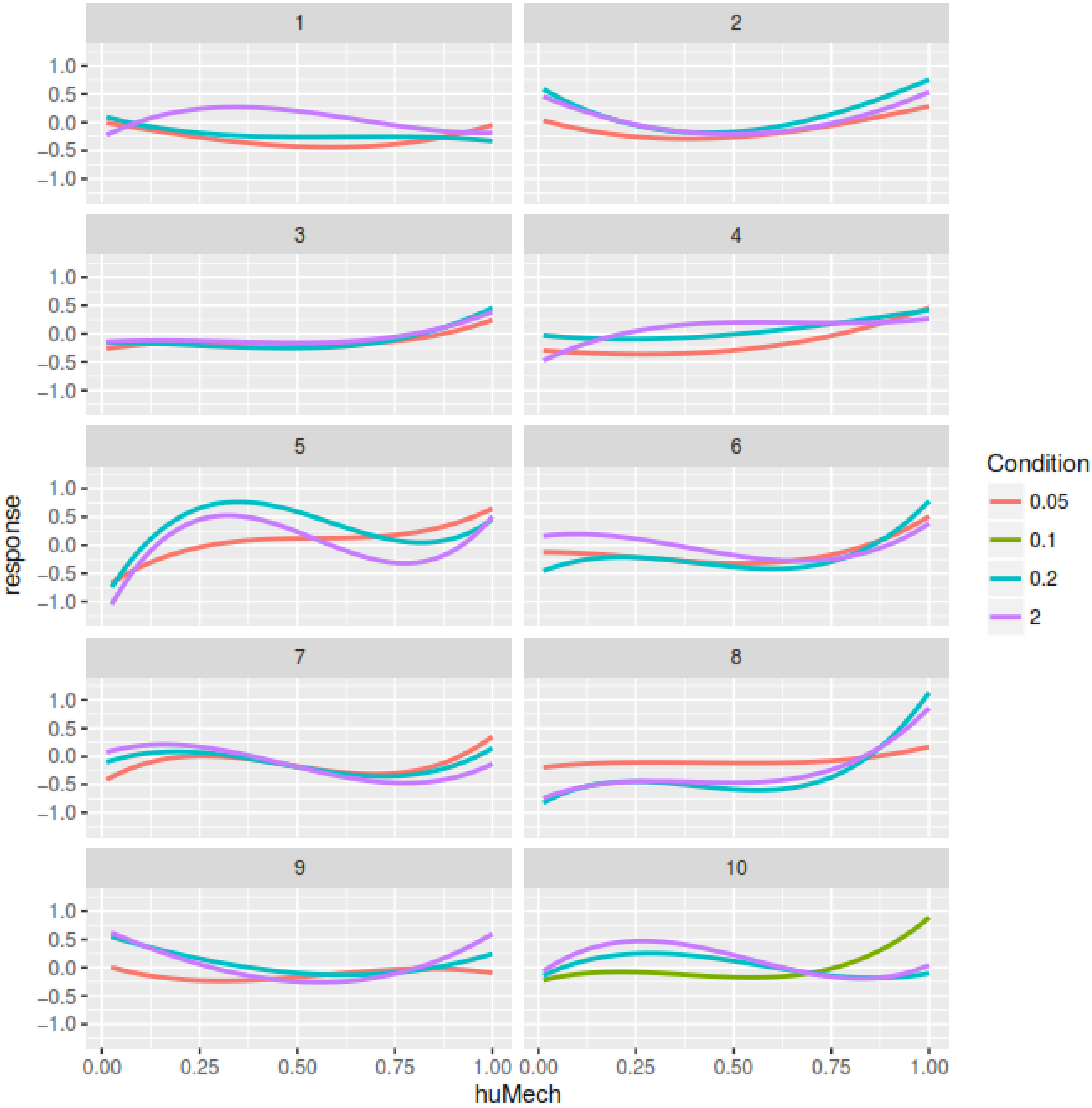
We compute the posterior distribution of troughs:

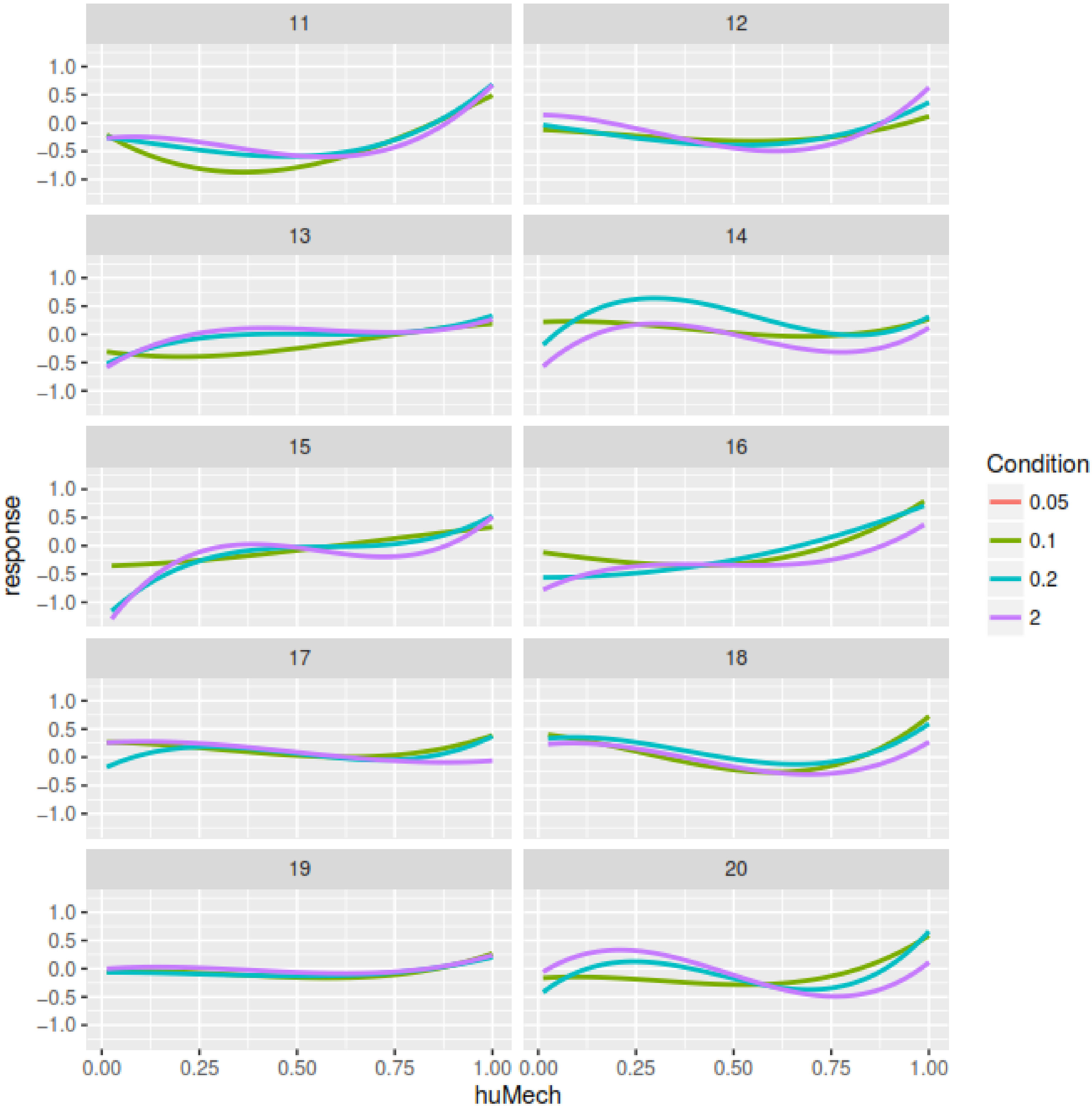
```
T_1_fitted <-
  fitted(M_1)

T_1_poly <-
  expand.grid(huMech = seq(from = -1, to = 1, length.out = 101),
              Condition = unique(T_1$Condition)) %>%
  as_data_frame() %>%
  mutate(Condition = as.character(Condition)) %>%
  right_join(T_1, by = "Condition") %>%
  mutate(score = huMech0 + huMech1 * huMech +
           huMech2 * huMech^2 + huMech3 * huMech^3)



P_1_tr <-
  P_1 %>%
  filter(type == "fixef") %>%
  select(iter, Condition, par_poly, value) %>%
  spread(par_poly, value) %>%
  mutate(trough = trough(.[3:6]))

T_1_tr <-
  P_1_tr %>%
  filter(!is.na(trough)) %>%
  group_by(Condition) %>%
  dplyr::summarize(center = modeest::shorth(trough),
            lower = quantile(trough, .025),
            upper = quantile(trough, .975))

T_1_tr

PS_2 %>%
  filter(!Condition == "0.05") %>%
  ggplot(aes(x = huMech, y = response, col = Condition)) +
  geom_point(alpha = .3) +
  geom_smooth(method="lm", se=TRUE, fill=NA,
              formula=y ~ poly(x, 3, raw=TRUE)) +
```

```r
#geom_point(data = T_1_tr, aes(x = center), y = -0.4, size = 3) +
geom_errorbarh(data = filter(T_1_tr, !Condition == "0.05"),
               aes(x = center,
                   xmin = lower,
                   xmax = upper,
                   y = c(-0.4, -0.35, -0.3)),
               height = .1)
```

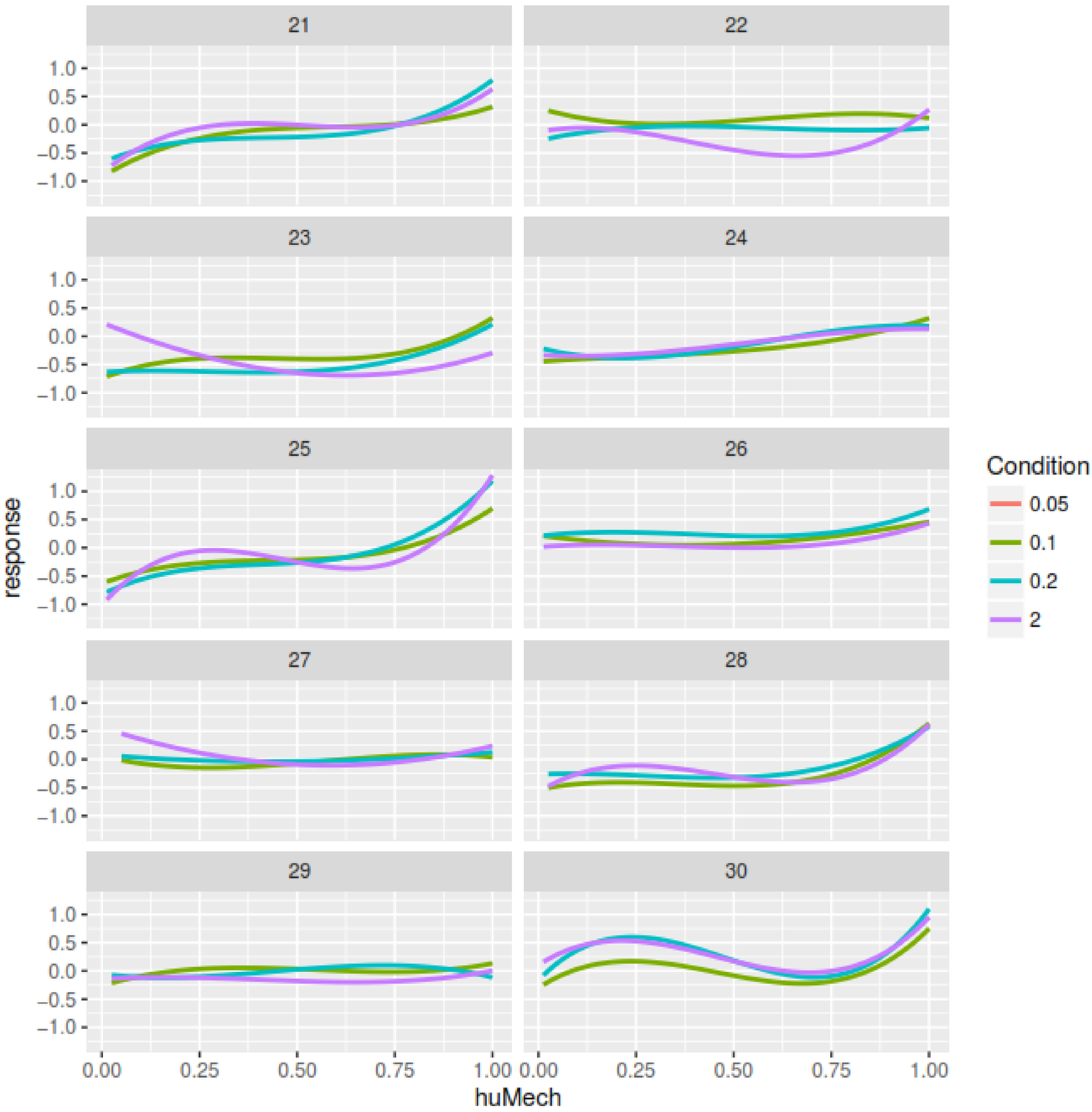
Appendix C

The individual graphs of the participants in this experiment. For explanation of the used terms, see fig. 3.

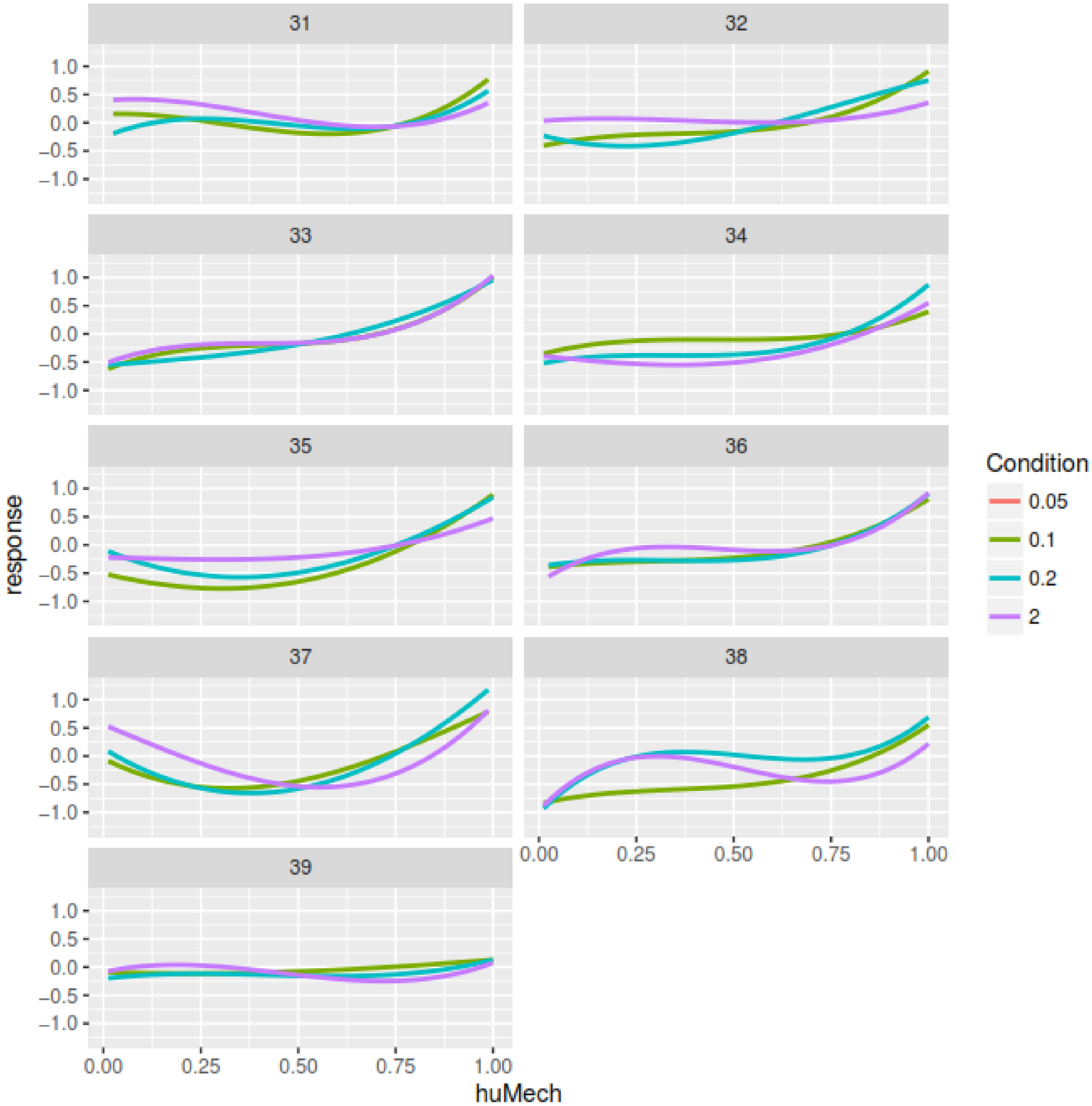




11
12
13
14
15
16
17
18
19
20
1.0
0.5
0.0
−0.5
−1.0
0.00
0.25
0.50
0.75
1.00
response
huMech
Condition
0.05
0.1
0.2
2



21
22
23
24
25
26
27
28
29
30
1.0
0.5
0.0
−0.5
−1.0
0.00
0.25
0.50
0.75
1.00
response
huMech
Condition
0.05
0.1
0.2
2


31
32
33
34
35
36
37
38
39
1.0
0.5
0.0
−0.5
−1.0
0.00
0.25
0.50
0.75
1.00
response
huMech
Condition
0.05
0.1
0.2
2

Appendix D

The table shows the summary for all participants. The parameters represent the individual polynomial coefficients, from which the position and depth of the trough has been derived. The 0.05s condition was removed, as well with the participants 1 – 9.

Part	parameter	Condition	center	lower	upper
1	fall	Condition0.05	0.1211728	-0.1229854	0.3880939
1	fall	Condition0.1	0.0248916	-0.1941249	0.2612674
1	fall	Condition0.2	0.0951217	-0.1492459	0.3822923
1	fall	Condition2	0.1012994	-0.1905935	0.3760793
1	huMech0	Condition0.05	-0.2645652	-0.4990496	-0.0013766
1	huMech0	Condition0.1	-0.2475474	-0.7528218	0.2948191
1	huMech0	Condition0.2	-0.2628970	-0.5115284	0.0014813
1	huMech0	Condition2	-0.0722292	-0.3310152	0.1885310
1	huMech1	Condition0.05	0.5116221	-1.3102070	2.3219452
1	huMech1	Condition0.1	0.5334918	-0.8628817	1.9614696
1	huMech1	Condition0.2	1.5412418	0.0582969	2.8816944
1	huMech1	Condition2	2.7027212	1.2367163	4.0726802
1	huMech2	Condition0.05	-2.4405290	-6.5309282	1.5987143
1	huMech2	Condition0.1	-1.9866610	-5.2546374	1.2130076
1	huMech2	Condition0.2	-4.7387225	-7.8341386	-1.5881712
1	huMech2	Condition2	-7.1467460	-10.2424005	-4.0724682
1	huMech3	Condition0.05	2.1007279	-0.4704346	4.7348656
1	huMech3	Condition0.1	2.2727431	0.1534181	4.4188449
1	huMech3	Condition0.2	3.3211733	1.2433052	5.3734077
1	huMech3	Condition2	4.6517653	2.6151775	6.7302580
1	low_like	Condition0.05	-0.2645652	-0.4990496	-0.0013766
1	low_like	Condition0.1	-0.2475474	-0.7528218	0.2948191
1	low_like	Condition0.2	-0.2628970	-0.5115284	0.0014813
1	low_like	Condition2	-0.0722292	-0.3310152	0.1885310
1	trough	Condition0.05	0.6532463	0.4324792	0.7679823
1	trough	Condition0.1	0.4655138	0.2232633	0.7789108
1	trough	Condition0.2	0.7258847	0.6256718	0.8857350
1	trough	Condition2	0.7739261	0.7053144	0.9168364
1	trough_like	Condition0.05	-0.3708413	-0.5406698	-0.2328599
1	trough_like	Condition0.1	-0.2647325	-0.7874770	0.2736566
1	trough_like	Condition0.2	-0.3614328	-0.5293292	-0.2036098

1	trough_like	Condition2	-0.1633983	-0.3378044	-0.0051677
10	fall	Condition0.05	0.0711263	-0.2541739	0.4536558
10	fall	Condition0.1	0.0075484	-0.2244791	0.1854689
10	fall	Condition0.2	0.1296195	-0.1361319	0.4341013
10	fall	Condition2	0.2091710	-0.0750638	0.5008080
10	huMech0	Condition0.05	-0.2485695	-0.4947043	0.0245565
10	huMech0	Condition0.1	-0.1979550	-0.4212456	0.0412386
10	huMech0	Condition0.2	-0.0116294	-0.2606379	0.2417448
10	huMech0	Condition2	0.0871906	-0.1644100	0.3567706
10	huMech1	Condition0.05	0.7259995	-1.1593880	2.5611247
10	huMech1	Condition0.1	0.5685218	-0.8657592	1.9743255
10	huMech1	Condition0.2	1.7088299	0.2495517	3.0503458
10	huMech1	Condition2	2.5270694	1.0578611	3.9494832
10	huMech2	Condition0.05	-2.6248043	-6.4459648	1.7637804
10	huMech2	Condition0.1	-1.8929841	-5.2374608	1.1771440
10	huMech2	Condition0.2	-4.5975731	-7.8119864	-1.5664388
10	huMech2	Condition2	-7.3211175	-10.2361554	-4.1124708
10	huMech3	Condition0.05	2.1811778	-0.4421790	4.8520022
10	huMech3	Condition0.1	2.4837944	0.3956347	4.5134342
10	huMech3	Condition0.2	3.0453875	0.9579522	5.0858787
10	huMech3	Condition2	4.8133021	2.6963496	6.7169868
10	low_like	Condition0.05	-0.2485695	-0.4947043	0.0245565
10	low_like	Condition0.1	-0.1979550	-0.4212456	0.0412386
10	low_like	Condition0.2	-0.0116294	-0.2606379	0.2417448
10	low_like	Condition2	0.0871906	-0.1644100	0.3567706
10	trough	Condition0.05	0.5783728	0.2191071	0.8732309
10	trough	Condition0.1	0.4121961	0.2155323	0.5331035
10	trough	Condition0.2	0.7917859	0.6811908	1.1178620
10	trough	Condition2	0.7923568	0.7206653	0.9315939
10	trough_like	Condition0.05	-0.2289393	-0.6988863	-0.0274772
10	trough_like	Condition0.1	-0.1589252	-0.3098658	0.0017806
10	trough_like	Condition0.2	-0.1413833	-0.3488955	0.0311036
10	trough_like	Condition2	-0.1248774	-0.2914721	0.0372899
11	fall	Condition0.05	0.0381166	-0.2581482	0.4374737
11	fall	Condition0.1	0.0208715	-0.2092246	0.1967156
11	fall	Condition0.2	-0.1283684	-0.3479745	0.1461896
11	fall	Condition2	-0.0803723	-0.3358266	0.2452179
11	huMech0	Condition0.05	-0.2431298	-0.4872629	0.0267631

11	huMech0	Condition0.1	-0.6416007	-0.8855029	-0.4082059
11	huMech0	Condition0.2	-0.5706854	-0.8158019	-0.2916701
11	huMech0	Condition2	-0.4981510	-0.7631080	-0.2116760
11	huMech1	Condition0.05	0.7835372	-1.1239439	2.5578450
11	huMech1	Condition0.1	0.5318223	-0.8775472	1.9506975
11	huMech1	Condition0.2	1.5178695	0.0726337	2.9045856
11	huMech1	Condition2	2.2415675	0.6928630	3.6334227
11	huMech2	Condition0.05	-2.7514931	-6.4323356	1.7962302
11	huMech2	Condition0.1	-1.8103764	-5.2018326	1.2232475
11	huMech2	Condition0.2	-4.6963697	-7.6468105	-1.4889812
11	huMech2	Condition2	-7.1859445	-10.1588790	-4.0485968
11	huMech3	Condition0.05	2.3425513	-0.4860246	4.8208664
11	huMech3	Condition0.1	2.5678436	0.5483626	4.7048696
11	huMech3	Condition0.2	4.1030043	2.1428484	6.2560859
11	huMech3	Condition2	5.9822237	3.9375455	7.9536825
11	low_like	Condition0.05	-0.2431298	-0.4872629	0.0267631
11	low_like	Condition0.1	-0.6416007	-0.8855029	-0.4082059
11	low_like	Condition0.2	-0.5706854	-0.8158019	-0.2916701
11	low_like	Condition2	-0.4981510	-0.7631080	-0.2116760
11	trough	Condition0.05	0.5667572	0.2262233	0.8180183
11	trough	Condition0.1	0.3673501	0.1966824	0.5002133
11	trough	Condition0.2	0.4953222	0.3581837	0.5784664
11	trough	Condition2	0.5929002	0.5141711	0.6483700
11	trough_like	Condition0.05	-0.2273281	-0.6478427	-0.0231254
11	trough_like	Condition0.1	-0.5998956	-0.7753218	-0.4343279
11	trough_like	Condition0.2	-0.4424635	-0.6136540	-0.2728758
11	trough_like	Condition2	-0.4414350	-0.6132321	-0.2833893
12	fall	Condition0.05	0.0270855	-0.2700755	0.4360347
12	fall	Condition0.1	0.0360401	-0.1573650	0.2475376
12	fall	Condition0.2	-0.0606696	-0.2842817	0.2256567
12	fall	Condition2	0.1214642	-0.1732042	0.4159795
12	huMech0	Condition0.05	-0.2372610	-0.4816614	0.0260609
12	huMech0	Condition0.1	-0.2550075	-0.5019175	-0.0349315
12	huMech0	Condition0.2	-0.3734321	-0.6122402	-0.1034226
12	huMech0	Condition2	-0.2358249	-0.5084917	0.0318842
12	huMech1	Condition0.05	0.7214909	-1.1508649	2.5273831
12	huMech1	Condition0.1	0.4535016	-0.8989777	1.9286564
12	huMech1	Condition0.2	1.4640538	0.0351138	2.8777406

12	huMech1	Condition2	2.0567017	0.5041413	3.4287386
12	huMech2	Condition0.05	-2.4142659	-6.3570205	1.7967047
12	huMech2	Condition0.1	-2.2724056	-5.3785829	1.0938184
12	huMech2	Condition0.2	-4.7598609	-7.7506686	-1.5312261
12	huMech2	Condition2	-7.2535240	-10.1402685	-4.0261092
12	huMech3	Condition0.05	2.1190835	-0.4703096	4.8318942
12	huMech3	Condition0.1	1.9068324	-0.0683308	4.0951271
12	huMech3	Condition0.2	3.6816183	1.8473960	5.8839957
12	huMech3	Condition2	5.8363375	3.7851817	7.8833676
12	low_like	Condition0.05	-0.2372610	-0.4816614	0.0260609
12	low_like	Condition0.1	-0.2550075	-0.5019175	-0.0349315
12	low_like	Condition0.2	-0.3734321	-0.6122402	-0.1034226
12	low_like	Condition2	-0.2358249	-0.5084917	0.0318842
12	trough	Condition0.05	0.5733871	0.1946689	0.8561216
12	trough	Condition0.1	0.5771355	0.3452286	0.7030657
12	trough	Condition0.2	0.5936529	0.4526710	0.6767653
12	trough	Condition2	0.6424346	0.5755014	0.6967333
12	trough_like	Condition0.05	-0.2398861	-0.6730107	-0.0124474
12	trough_like	Condition0.1	-0.3110055	-0.4566440	-0.1587834
12	trough_like	Condition0.2	-0.3206470	-0.4753893	-0.1578287
12	trough_like	Condition2	-0.3485621	-0.5176673	-0.1904838
13	fall	Condition0.05	0.0390809	-0.2781701	0.4451717
13	fall	Condition0.1	0.0089673	-0.2238775	0.1812275
13	fall	Condition0.2	-0.1595062	-0.4215838	0.0555565
13	fall	Condition2	-0.2164301	-0.5288153	0.0358815
13	huMech0	Condition0.05	-0.2202962	-0.4877562	0.0377658
13	huMech0	Condition0.1	-0.3616588	-0.5912241	-0.1272405
13	huMech0	Condition0.2	-0.3159726	-0.5843232	-0.0659678
13	huMech0	Condition2	-0.3429085	-0.6048820	-0.0816995
13	huMech1	Condition0.05	0.7458125	-1.1295788	2.6370089
13	huMech1	Condition0.1	0.4785453	-0.8329707	2.0110004
13	huMech1	Condition0.2	1.8181769	0.3980916	3.2778692
13	huMech1	Condition2	2.9278281	1.4542001	4.3214948
13	huMech2	Condition0.05	-2.4333229	-6.4307969	1.7648806
13	huMech2	Condition0.1	-1.9210405	-5.2825600	1.1932118
13	huMech2	Condition0.2	-4.5440646	-7.6589541	-1.5316380
13	huMech2	Condition2	-7.1521991	-10.2292103	-4.0753043
13	huMech3	Condition0.05	2.1004213	-0.4515941	4.8403055

13	huMech3	Condition0.1	2.1106482	0.1605684	4.2900531
13	huMech3	Condition0.2	3.5370195	1.4852878	5.5952235
13	huMech3	Condition2	5.0702883	2.9818160	7.0738005
13	low_like	Condition0.05	-0.2202962	-0.4877562	0.0377658
13	low_like	Condition0.1	-0.3616588	-0.5912241	-0.1272405
13	low_like	Condition0.2	-0.3159726	-0.5843232	-0.0659678
13	low_like	Condition2	-0.3429085	-0.6048820	-0.0816995
13	trough	Condition0.05	0.5605617	0.2075118	0.8404217
13	trough	Condition0.1	0.4500935	0.2355295	0.5792604
13	trough	Condition0.2	0.5893946	0.4272034	0.6857136
13	trough	Condition2	0.6539762	0.5468931	0.7346760
13	trough_like	Condition0.05	-0.2422658	-0.6542038	-0.0171780
13	trough_like	Condition0.1	-0.3202501	-0.4859316	-0.1849672
13	trough_like	Condition0.2	-0.1194241	-0.2854512	0.0366689
13	trough_like	Condition2	-0.1153504	-0.2666003	0.0680671
14	fall	Condition0.05	0.0250666	-0.2825873	0.4245881
14	fall	Condition0.1	0.0778100	-0.1300603	0.2914288
14	fall	Condition0.2	0.1556558	-0.1146287	0.4660808
14	fall	Condition2	0.0876657	-0.2065421	0.3805207
14	huMech0	Condition0.05	-0.2293363	-0.4962856	0.0190745
14	huMech0	Condition0.1	0.0610898	-0.1645212	0.3105563
14	huMech0	Condition0.2	0.2502860	-0.0008025	0.5056283
14	huMech0	Condition2	-0.1792650	-0.4494064	0.0910736
14	huMech1	Condition0.05	0.6715992	-1.1508479	2.5817049
14	huMech1	Condition0.1	0.4465143	-0.8798947	1.9514742
14	huMech1	Condition0.2	1.7552779	0.2284488	3.0690273
14	huMech1	Condition2	2.5253189	1.0442167	3.9718965
14	huMech2	Condition0.05	-2.3958522	-6.3835631	1.7701077
14	huMech2	Condition0.1	-2.1699985	-5.3942327	1.0693542
14	huMech2	Condition0.2	-4.7465560	-7.8243008	-1.6104273
14	huMech2	Condition2	-7.3345100	-10.2271591	-4.0940719
14	huMech3	Condition0.05	2.3523245	-0.4875210	4.8455381
14	huMech3	Condition0.1	1.9620141	-0.2322576	3.9628666
14	huMech3	Condition0.2	2.9079048	0.9389473	5.0752725
14	huMech3	Condition2	5.0128936	2.9180133	6.9413252
14	low_like	Condition0.05	-0.2293363	-0.4962856	0.0190745
14	low_like	Condition0.1	0.0610898	-0.1645212	0.3105563
14	low_like	Condition0.2	0.2502860	-0.0008025	0.5056283

14	low_like	Condition2	-0.1792650	-0.4494064	0.0910736
14	trough	Condition0.05	0.5695961	0.2324794	0.8417535
14	trough	Condition0.1	0.6320675	0.4062892	0.7926272
14	trough	Condition0.2	0.7986049	0.7002926	1.1432101
14	trough	Condition2	0.7327462	0.6684298	0.8362280
14	trough_like	Condition0.05	-0.2255450	-0.6576806	-0.0226357
14	trough_like	Condition0.1	-0.0141554	-0.1567774	0.1379609
14	trough_like	Condition0.2	0.1010252	-0.1151444	0.2598987
14	trough_like	Condition2	-0.2608046	-0.4242430	-0.0945100
15	fall	Condition0.05	0.0380747	-0.2587587	0.4767634
15	fall	Condition0.1	-0.0037625	-0.2278929	0.1819626
15	fall	Condition0.2	-0.2208193	-0.4877072	0.0255049
15	fall	Condition2	-0.3002204	-0.5857737	-0.0020065
15	huMech0	Condition0.05	-0.2407732	-0.4943269	0.0304840
15	huMech0	Condition0.1	-0.2290808	-0.4584446	0.0265993
15	huMech0	Condition0.2	-0.5324926	-0.8045544	-0.2490595
15	huMech0	Condition2	-0.5674249	-0.8211854	-0.2636093
15	huMech1	Condition0.05	0.7319730	-1.1113118	2.5838521
15	huMech1	Condition0.1	0.5501058	-0.8376792	1.9861774
15	huMech1	Condition0.2	1.9829895	0.4915540	3.3808377
15	huMech1	Condition2	2.9310196	1.4337233	4.3640841
15	huMech2	Condition0.05	-2.3374317	-6.4104224	1.7618356
15	huMech2	Condition0.1	-1.9457031	-5.2467929	1.1880859
15	huMech2	Condition0.2	-4.6254836	-7.5886383	-1.5100859
15	huMech2	Condition2	-7.2706021	-10.1444405	-3.9861398
15	huMech3	Condition0.05	2.3394424	-0.4592908	4.8223580
15	huMech3	Condition0.1	2.3130740	0.1475253	4.3068169
15	huMech3	Condition0.2	3.6572348	1.6319841	5.7645436
15	huMech3	Condition2	5.2495073	3.1823360	7.2941906
15	low_like	Condition0.05	-0.2407732	-0.4943269	0.0304840
15	low_like	Condition0.1	-0.2290808	-0.4584446	0.0265993
15	low_like	Condition0.2	-0.5324926	-0.8045544	-0.2490595
15	low_like	Condition2	-0.5674249	-0.8211854	-0.2636093
15	trough	Condition0.05	0.5737962	0.2185263	0.8744668
15	trough	Condition0.1	0.4502919	0.2299429	0.5793948
15	trough	Condition0.2	0.5003110	0.3499048	0.5929391
15	trough	Condition2	0.6106895	0.5008814	0.6831627
15	trough_like	Condition0.05	-0.2233274	-0.6770328	-0.0181759

15	trough_like	Condition0.1	-0.1824475	-0.3470317	-0.0279696
15	trough_like	Condition0.2	-0.2254488	-0.3903667	-0.0655662
15	trough_like	Condition2	-0.2608951	-0.4203402	-0.0846703
16	fall	Condition0.05	0.0506502	-0.2688640	0.4558997
16	fall	Condition0.1	0.0158765	-0.2103783	0.1881002
16	fall	Condition0.2	-0.2136875	-0.4474301	0.0366059
16	fall	Condition2	-0.1994793	-0.4556336	0.0728348
16	huMech0	Condition0.05	-0.2449955	-0.4910393	0.0271021
16	huMech0	Condition0.1	-0.3057000	-0.5374567	-0.0810761
16	huMech0	Condition0.2	-0.5809666	-0.8387713	-0.3391534
16	huMech0	Condition2	-0.6146422	-0.8581149	-0.3567297
16	huMech1	Condition0.05	0.7085298	-1.1945102	2.5625668
16	huMech1	Condition0.1	0.5789785	-0.8990014	1.9441634
16	huMech1	Condition0.2	1.8743861	0.3999046	3.2374239
16	huMech1	Condition2	2.6938663	1.1676927	4.0236134
16	huMech2	Condition0.05	-2.3795342	-6.3695397	1.8084291
16	huMech2	Condition0.1	-1.9727702	-5.2309513	1.1900921
16	huMech2	Condition0.2	-4.3660082	-7.6841692	-1.3898465
16	huMech2	Condition2	-7.1670975	-10.1741317	-4.0763044
16	huMech3	Condition0.05	2.1435387	-0.4118856	4.8405788
16	huMech3	Condition0.1	2.4920825	0.5237421	4.6365013
16	huMech3	Condition0.2	4.2513474	2.1515165	6.2836596
16	huMech3	Condition2	5.4751531	3.5520927	7.6110435
16	low_like	Condition0.05	-0.2449955	-0.4910393	0.0271021
16	low_like	Condition0.1	-0.3057000	-0.5374567	-0.0810761
16	low_like	Condition0.2	-0.5809666	-0.8387713	-0.3391534
16	low_like	Condition2	-0.6146422	-0.8581149	-0.3567297
16	trough	Condition0.05	0.5602965	0.2218301	0.8448251
16	trough	Condition0.1	0.3678402	0.2131342	0.5071535
16	trough	Condition0.2	0.4323360	0.2837657	0.5260092
16	trough	Condition2	0.5922860	0.4855705	0.6566748
16	trough_like	Condition0.05	-0.2305011	-0.6728171	-0.0096468
16	trough_like	Condition0.1	-0.2689076	-0.4382748	-0.1165517
16	trough_like	Condition0.2	-0.3134524	-0.4816483	-0.1461418
16	trough_like	Condition2	-0.4080275	-0.5718379	-0.2458602
17	fall	Condition0.05	0.0185052	-0.2702448	0.4416922
17	fall	Condition0.1	0.0351415	-0.1575396	0.2641609
17	fall	Condition0.2	-0.0701530	-0.3024376	0.1755889

17	fall	Condition2	0.1610885	-0.0986161	0.4578231
17	huMech0	Condition0.05	-0.2200416	-0.4991199	0.0471805
17	huMech0	Condition0.1	0.0613355	-0.1758827	0.2952530
17	huMech0	Condition0.2	-0.0913243	-0.3465566	0.1509428
17	huMech0	Condition2	0.0148822	-0.2187538	0.2987359
17	huMech1	Condition0.05	0.7574169	-1.2041393	2.5657859
17	huMech1	Condition0.1	0.4331542	-0.9181366	1.9173496
17	huMech1	Condition0.2	1.6912005	0.2127450	3.0121350
17	huMech1	Condition2	2.4991422	0.9126253	3.8556489
17	huMech2	Condition0.05	-2.5521345	-6.4036718	1.7371774
17	huMech2	Condition0.1	-2.0102105	-5.3385442	1.1012006
17	huMech2	Condition0.2	-4.4560600	-7.7233522	-1.5330875
17	huMech2	Condition2	-7.3600004	-10.2475142	-4.1174192
17	huMech3	Condition0.05	2.1643106	-0.3921927	4.8967762
17	huMech3	Condition0.1	2.1108127	-0.1198976	4.0870268
17	huMech3	Condition0.2	3.3556133	1.4353264	5.4199797
17	huMech3	Condition2	4.9445998	2.8729746	6.9947082
17	low_like	Condition0.05	-0.2200416	-0.4991199	0.0471805
17	low_like	Condition0.1	0.0613355	-0.1758827	0.2952530
17	low_like	Condition0.2	-0.0913243	-0.3465566	0.1509428
17	low_like	Condition2	0.0148822	-0.2187538	0.2987359
17	trough	Condition0.05	0.5664456	0.2133860	0.8575968
17	trough	Condition0.1	0.5764975	0.3508701	0.7075038
17	trough	Condition0.2	0.6506806	0.5004603	0.7579182
17	trough	Condition2	0.7530543	0.6882498	0.8537651
17	trough_like	Condition0.05	-0.2458653	-0.6533557	-0.0108323
17	trough_like	Condition0.1	0.0222672	-0.1360890	0.1654209
17	trough_like	Condition0.2	-0.0278038	-0.1925187	0.1181940
17	trough_like	Condition2	-0.1424124	-0.3058941	0.0172317
18	fall	Condition0.05	0.0220908	-0.2681862	0.4483136
18	fall	Condition0.1	0.0441367	-0.1612071	0.2550528
18	fall	Condition0.2	0.0158499	-0.2178612	0.3069356
18	fall	Condition2	0.1705523	-0.0958319	0.4568561
18	huMech0	Condition0.05	-0.2400791	-0.4851518	0.0262032
18	huMech0	Condition0.1	-0.0758418	-0.3051863	0.1838979
18	huMech0	Condition0.2	0.0308960	-0.2405643	0.2846434
18	huMech0	Condition2	-0.0712445	-0.3477490	0.1994156
18	huMech1	Condition0.05	0.6585626	-1.1596004	2.5542461

18	huMech1	Condition0.1	0.4313872	-0.9277499	1.9027784
18	huMech1	Condition0.2	1.5168464	-0.0333770	2.8581911
18	huMech1	Condition2	2.2870971	0.7018344	3.6358161
18	huMech2	Condition0.05	-2.4032029	-6.4159454	1.7919291
18	huMech2	Condition0.1	-2.1075305	-5.3504252	1.0746868
18	huMech2	Condition0.2	-4.6102974	-7.7947275	-1.6012202
18	huMech2	Condition2	-7.1401407	-10.2064930	-4.0845332
18	huMech3	Condition0.05	2.2393409	-0.4178356	4.8708318
18	huMech3	Condition0.1	2.1796800	0.1375648	4.3303039
18	huMech3	Condition0.2	3.7045834	1.6416750	5.6531857
18	huMech3	Condition2	5.3074573	3.2992308	7.3004828
18	low_like	Condition0.05	-0.2400791	-0.4851518	0.0262032
18	low_like	Condition0.1	-0.0758418	-0.3051863	0.1838979
18	low_like	Condition0.2	0.0308960	-0.2405643	0.2846434
18	low_like	Condition2	-0.0712445	-0.3477490	0.1994156
18	trough	Condition0.05	0.5777859	0.2230325	0.8466447
18	trough	Condition0.1	0.5256311	0.3134719	0.6375445
18	trough	Condition0.2	0.6552783	0.5277809	0.7424395
18	trough	Condition2	0.7124524	0.6482796	0.7792511
18	trough_like	Condition0.05	-0.2200557	-0.6580915	-0.0251444
18	trough_like	Condition0.1	-0.0954781	-0.2609508	0.0636559
18	trough_like	Condition0.2	-0.0132970	-0.1598946	0.1510625
18	trough_like	Condition2	-0.2537579	-0.4129450	-0.1017880
19	fall	Condition0.05	0.0425268	-0.2704024	0.4641380
19	fall	Condition0.1	0.0158916	-0.1761069	0.2213315
19	fall	Condition0.2	-0.0908339	-0.3265794	0.1554531
19	fall	Condition2	-0.0647851	-0.3331680	0.2195251
19	huMech0	Condition0.05	-0.2169274	-0.4876539	0.0338498
19	huMech0	Condition0.1	-0.1560413	-0.3854376	0.0676288
19	huMech0	Condition0.2	-0.2485115	-0.5024668	0.0140365
19	huMech0	Condition2	-0.2090860	-0.4564483	0.0674220
19	huMech1	Condition0.05	0.8247980	-1.1408858	2.5746747
19	huMech1	Condition0.1	0.4499607	-0.8706846	1.9624428
19	huMech1	Condition0.2	1.7717524	0.2143721	3.0706548
19	huMech1	Condition2	2.5623016	1.1362619	3.9366868
19	huMech2	Condition0.05	-2.4331355	-6.3772553	1.8089103
19	huMech2	Condition0.1	-2.0865334	-5.2642729	1.1048298
19	huMech2	Condition0.2	-4.6660074	-7.7821181	-1.5151037

19	huMech2	Condition2	-7.3443311	-10.2250215	-4.0214090
19	huMech3	Condition0.05	2.3403751	-0.4720162	4.7989919
19	huMech3	Condition0.1	2.0533677	-0.0056222	4.1127829
19	huMech3	Condition0.2	3.5302625	1.5115973	5.5317692
19	huMech3	Condition2	5.2801941	3.1920785	7.2749716
19	low_like	Condition0.05	-0.2169274	-0.4876539	0.0338498
19	low_like	Condition0.1	-0.1560413	-0.3854376	0.0676288
19	low_like	Condition0.2	-0.2485115	-0.5024668	0.0140365
19	low_like	Condition2	-0.2090860	-0.4564483	0.0674220
19	trough	Condition0.05	0.5696333	0.2277602	0.8631395
19	trough	Condition0.1	0.5466683	0.3193203	0.6723105
19	trough	Condition0.2	0.6287630	0.4651422	0.7298260
19	trough	Condition2	0.6756823	0.5946111	0.7433474
19	trough_like	Condition0.05	-0.2299133	-0.6850395	-0.0152989
19	trough_like	Condition0.1	-0.1771806	-0.3141052	-0.0213248
19	trough_like	Condition0.2	-0.1516224	-0.3008818	0.0022794
19	trough_like	Condition2	-0.1408136	-0.2986686	0.0189858
2	fall	Condition0.05	0.0041632	-0.2725950	0.2523460
2	fall	Condition0.1	0.0289583	-0.1959079	0.2771414
2	fall	Condition0.2	-0.0684263	-0.3041694	0.1870411
2	fall	Condition2	0.0151743	-0.2499329	0.3029199
2	huMech0	Condition0.05	-0.2222318	-0.4731479	0.0102667
2	huMech0	Condition0.1	-0.2681743	-0.7450727	0.2446603
2	huMech0	Condition0.2	-0.0696761	-0.3256822	0.1856557
2	huMech0	Condition2	-0.1228377	-0.3776860	0.1709680
2	huMech1	Condition0.05	0.7425633	-1.1461147	2.5646520
2	huMech1	Condition0.1	0.5713758	-0.8351142	1.9568881
2	huMech1	Condition0.2	1.4970285	-0.0003425	2.9243619
2	huMech1	Condition2	2.3254510	0.8014529	3.6949653
2	huMech2	Condition0.05	-2.3893880	-6.3479489	1.7868495
2	huMech2	Condition0.1	-2.0578518	-5.2471977	1.1437535
2	huMech2	Condition0.2	-4.4820496	-7.7279843	-1.5681981
2	huMech2	Condition2	-7.1603222	-10.1836385	-4.0349954
2	huMech3	Condition0.05	2.3094752	-0.3897292	4.7833817
2	huMech3	Condition0.1	2.3199600	0.1100020	4.4708429
2	huMech3	Condition0.2	3.9680418	1.9768872	5.9567606
2	huMech3	Condition2	5.7428560	3.5958544	7.6096641
2	low_like	Condition0.05	-0.2222318	-0.4731479	0.0102667

2	low_like	Condition0.1	-0.2681743	-0.7450727	0.2446603
2	low_like	Condition0.2	-0.0696761	-0.3256822	0.1856557
2	low_like	Condition2	-0.1228377	-0.3776860	0.1709680
2	trough	Condition0.05	0.5349629	0.2602333	0.6484676
2	trough	Condition0.1	0.4517093	0.2162814	0.7770146
2	trough	Condition0.2	0.5619706	0.4087142	0.6422530
2	trough	Condition2	0.6422296	0.5720801	0.7054805
2	trough_like	Condition0.05	-0.2098118	-0.3528190	-0.0785732
2	trough_like	Condition0.1	-0.2725343	-0.7549569	0.2206222
2	trough_like	Condition0.2	-0.0074480	-0.1656590	0.1467476
2	trough_like	Condition2	-0.1290030	-0.2898885	0.0306624
20	fall	Condition0.05	0.0469677	-0.2688543	0.4859416
20	fall	Condition0.1	0.0145958	-0.2100542	0.1983501
20	fall	Condition0.2	-0.0341324	-0.2734912	0.2524434
20	fall	Condition2	0.3189873	0.0525314	0.6284982
20	huMech0	Condition0.05	-0.2403862	-0.4924992	0.0373557
20	huMech0	Condition0.1	-0.2569425	-0.4880753	-0.0216235
20	huMech0	Condition0.2	-0.1991952	-0.4603269	0.0521208
20	huMech0	Condition2	-0.0347687	-0.2623293	0.2753317
20	huMech1	Condition0.05	0.8091642	-1.1605360	2.5713298
20	huMech1	Condition0.1	0.4521871	-0.8689224	1.9523600
20	huMech1	Condition0.2	1.4666622	0.0316409	2.8821869
20	huMech1	Condition2	2.2177056	0.6730814	3.5821097
20	huMech2	Condition0.05	-2.5762905	-6.3358735	1.7405620
20	huMech2	Condition0.1	-2.0635970	-5.2813465	1.1531832
20	huMech2	Condition0.2	-4.7956169	-7.7457053	-1.5864097
20	huMech2	Condition2	-7.3257384	-10.2916904	-4.1210908
20	huMech3	Condition0.05	2.1416802	-0.4146791	4.8615923
20	huMech3	Condition0.1	2.3268144	0.2539445	4.4396809
20	huMech3	Condition0.2	3.6703052	1.7351667	5.8003903
20	huMech3	Condition2	5.1525373	3.0107236	7.0802033
20	low_like	Condition0.05	-0.2403862	-0.4924992	0.0373557
20	low_like	Condition0.1	-0.2569425	-0.4880753	-0.0216235
20	low_like	Condition0.2	-0.1991952	-0.4603269	0.0521208
20	low_like	Condition2	-0.0347687	-0.2623293	0.2753317
20	trough	Condition0.05	0.5641882	0.2293589	0.8936162
20	trough	Condition0.1	0.4538365	0.2532613	0.5777083
20	trough	Condition0.2	0.6215386	0.4770450	0.7005431

20	trough	Condition2	0.7606868	0.7014312	0.8578852
20	trough_like	Condition0.05	-0.2330532	-0.7152616	-0.0109213
20	trough_like	Condition0.1	-0.2311029	-0.3924297	-0.0794555
20	trough_like	Condition0.2	-0.1739056	-0.3320745	-0.0256791
20	trough_like	Condition2	-0.3410257	-0.5014183	-0.1687161
21	fall	Condition0.05	0.0385585	-0.2478626	0.4656354
21	fall	Condition0.1	0.0120975	-0.2118022	0.1775746
21	fall	Condition0.2	-0.1479443	-0.4070954	0.0648048
21	fall	Condition2	-0.2493404	-0.5146978	0.0292615
21	huMech0	Condition0.05	-0.2301180	-0.4987201	0.0449121
21	huMech0	Condition0.1	-0.2800797	-0.5090325	-0.0407923
21	huMech0	Condition0.2	-0.4644565	-0.7277784	-0.2091222
21	huMech0	Condition2	-0.3857190	-0.6469966	-0.1037449
21	huMech1	Condition0.05	0.7792408	-1.1492589	2.5640435
21	huMech1	Condition0.1	0.5742619	-0.8243507	1.9987490
21	huMech1	Condition0.2	1.7690805	0.2979843	3.0601229
21	huMech1	Condition2	2.6556735	1.3268949	4.1873740
21	huMech2	Condition0.05	-2.3873395	-6.4533584	1.7261068
21	huMech2	Condition0.1	-1.9519266	-5.2470346	1.1503524
21	huMech2	Condition0.2	-4.5235160	-7.6682286	-1.5042472
21	huMech2	Condition2	-7.1684613	-10.1571325	-4.0548002
21	huMech3	Condition0.05	2.1369408	-0.4437758	4.8487590
21	huMech3	Condition0.1	2.2042080	0.1207148	4.2829258
21	huMech3	Condition0.2	4.0768316	2.0472290	6.1307747
21	huMech3	Condition2	5.4114953	3.3648871	7.4479301
21	low_like	Condition0.05	-0.2301180	-0.4987201	0.0449121
21	low_like	Condition0.1	-0.2800797	-0.5090325	-0.0407923
21	low_like	Condition0.2	-0.4644565	-0.7277784	-0.2091222
21	low_like	Condition2	-0.3857190	-0.6469966	-0.1037449
21	trough	Condition0.05	0.5868130	0.2227222	0.8625875
21	trough	Condition0.1	0.4401241	0.2354063	0.5872973
21	trough	Condition0.2	0.4853683	0.3411960	0.5740675
21	trough	Condition2	0.5969147	0.4797915	0.6727716
21	trough_like	Condition0.05	-0.2405350	-0.6893019	-0.0234676
21	trough_like	Condition0.1	-0.2478071	-0.3988588	-0.0882627
21	trough_like	Condition0.2	-0.2581576	-0.4255702	-0.1001758
21	trough_like	Condition2	-0.1140649	-0.2810266	0.0237769
22	fall	Condition0.05	0.0467283	-0.2647798	0.4566357

22	fall	Condition0.1	0.0330986	-0.1730400	0.2292694
22	fall	Condition0.2	-0.0479781	-0.3096116	0.1932739
22	fall	Condition2	0.1398509	-0.1521371	0.4046731
22	huMech0	Condition0.05	-0.2272811	-0.4869728	0.0346848
22	huMech0	Condition0.1	0.0122645	-0.2148449	0.2415207
22	huMech0	Condition0.2	-0.2235623	-0.4920775	0.0131714
22	huMech0	Condition2	-0.3476979	-0.6119584	-0.0728596
22	huMech1	Condition0.05	0.6750530	-1.1635517	2.5668140
22	huMech1	Condition0.1	0.5617014	-0.8645463	1.9909578
22	huMech1	Condition0.2	1.6926103	0.2983536	3.1161235
22	huMech1	Condition2	2.2312278	0.6735506	3.5490535
22	huMech2	Condition0.05	-2.6703178	-6.4236604	1.7726753
22	huMech2	Condition0.1	-1.9971091	-5.3350583	1.0767726
22	huMech2	Condition0.2	-4.6844994	-7.7539511	-1.5559202
22	huMech2	Condition2	-7.1261001	-10.1612702	-4.0852858
22	huMech3	Condition0.05	2.1347567	-0.5026764	4.8626510
22	huMech3	Condition0.1	1.8750899	-0.1256354	4.0790157
22	huMech3	Condition0.2	3.2277625	1.2720436	5.3696807
22	huMech3	Condition2	5.6189909	3.5146046	7.5549394
22	low_like	Condition0.05	-0.2272811	-0.4869728	0.0346848
22	low_like	Condition0.1	0.0122645	-0.2148449	0.2415207
22	low_like	Condition0.2	-0.2235623	-0.4920775	0.0131714
22	low_like	Condition2	-0.3476979	-0.6119584	-0.0728596
22	trough	Condition0.05	0.5723917	0.2243849	0.8446152
22	trough	Condition0.1	0.5679344	0.3317319	0.7025066
22	trough	Condition0.2	0.6914353	0.5387679	0.8307756
22	trough	Condition2	0.6647033	0.6066610	0.7312374
22	trough_like	Condition0.05	-0.2294569	-0.6776192	-0.0244128
22	trough_like	Condition0.1	-0.0119664	-0.1623100	0.1391836
22	trough_like	Condition0.2	-0.1854652	-0.3393062	-0.0192096
22	trough_like	Condition2	-0.4616821	-0.6246022	-0.3064166
23	fall	Condition0.05	0.0383962	-0.2654547	0.4502572
23	fall	Condition0.1	0.0094881	-0.1995488	0.1855095
23	fall	Condition0.2	-0.1170639	-0.3449616	0.1198246
23	fall	Condition2	0.3618805	0.0661711	0.6541802
23	huMech0	Condition0.05	-0.2575238	-0.4930443	0.0340821
23	huMech0	Condition0.1	-0.4562143	-0.6850510	-0.2156345
23	huMech0	Condition0.2	-0.7130430	-0.9636462	-0.4532867

23	huMech0	Condition2	-0.3607251	-0.6143087	-0.0583729
23	huMech1	Condition0.05	0.6531020	-1.1788488	2.6058186
23	huMech1	Condition0.1	0.5060574	-0.8498498	1.9593482
23	huMech1	Condition0.2	1.6185324	0.2000009	2.9319581
23	huMech1	Condition2	1.9323221	0.4552371	3.3583435
23	huMech2	Condition0.05	-2.4241774	-6.4392780	1.7640695
23	huMech2	Condition0.1	-2.1746224	-5.2808216	1.1709706
23	huMech2	Condition0.2	-4.5274120	-7.7367869	-1.5165761
23	huMech2	Condition2	-7.1828728	-10.2172560	-4.1232890
23	huMech3	Condition0.05	2.2933904	-0.4556418	4.8469661
23	huMech3	Condition0.1	2.3278478	0.1464884	4.2921719
23	huMech3	Condition0.2	3.9423361	1.8425709	5.9545942
23	huMech3	Condition2	5.3481451	3.3139856	7.3627277
23	low_like	Condition0.05	-0.2575238	-0.4930443	0.0340821
23	low_like	Condition0.1	-0.4562143	-0.6850510	-0.2156345
23	low_like	Condition0.2	-0.7130430	-0.9636462	-0.4532867
23	low_like	Condition2	-0.3607251	-0.6143087	-0.0583729
23	trough	Condition0.05	0.5738459	0.2275322	0.8296531
23	trough	Condition0.1	0.4514830	0.2577246	0.5993242
23	trough	Condition0.2	0.5459278	0.3871207	0.6308821
23	trough	Condition2	0.7300820	0.6762700	0.8047255
23	trough_like	Condition0.05	-0.2287539	-0.6741161	-0.0179656
23	trough_like	Condition0.1	-0.4359960	-0.5873514	-0.2853609
23	trough_like	Condition0.2	-0.5722458	-0.7401092	-0.4236484
23	trough_like	Condition2	-0.7004946	-0.8549748	-0.5310018
24	fall	Condition0.05	0.0426459	-0.2766032	0.4945296
24	fall	Condition0.1	0.0123668	-0.2241595	0.1875692
24	fall	Condition0.2	-0.1656374	-0.4160531	0.0621097
24	fall	Condition2	-0.2397356	-0.5172842	0.0380471
24	huMech0	Condition0.05	-0.2370812	-0.4942287	0.0314660
24	huMech0	Condition0.1	-0.3641627	-0.5755575	-0.1137739
24	huMech0	Condition0.2	-0.4069258	-0.6395185	-0.1421969
24	huMech0	Condition2	-0.4406718	-0.7152030	-0.1760125
24	huMech1	Condition0.05	0.6800967	-1.1325991	2.5718179
24	huMech1	Condition0.1	0.4709983	-0.8347385	1.9668813
24	huMech1	Condition0.2	1.8597270	0.2848652	3.1850792
24	huMech1	Condition2	2.7790521	1.3770518	4.2248510
24	huMech2	Condition0.05	-2.4859550	-6.4099505	1.7400297

24	huMech2	Condition0.1	-1.9582915	-5.2991484	1.1804587
24	huMech2	Condition0.2	-4.5944213	-7.6817819	-1.4762804
24	huMech2	Condition2	-7.1956978	-10.1578996	-4.0075282
24	huMech3	Condition0.05	2.1573459	-0.4640926	4.8529619
24	huMech3	Condition0.1	2.0801776	0.1478017	4.3824642
24	huMech3	Condition0.2	3.6597800	1.5916421	5.7246911
24	huMech3	Condition2	5.1707832	3.1211351	7.1983754
24	low_like	Condition0.05	-0.2370812	-0.4942287	0.0314660
24	low_like	Condition0.1	-0.3641627	-0.5755575	-0.1137739
24	low_like	Condition0.2	-0.4069258	-0.6395185	-0.1421969
24	low_like	Condition2	-0.4406718	-0.7152030	-0.1760125
24	trough	Condition0.05	0.5713728	0.2110341	0.8803946
24	trough	Condition0.1	0.4422079	0.2403544	0.5774590
24	trough	Condition0.2	0.5432421	0.3925989	0.6539435
24	trough	Condition2	0.6297095	0.5167511	0.6991852
24	trough_like	Condition0.05	-0.2475449	-0.7081553	-0.0200867
24	trough_like	Condition0.1	-0.3189966	-0.4768117	-0.1700562
24	trough_like	Condition0.2	-0.2147885	-0.3643253	-0.0445020
24	trough_like	Condition2	-0.2094858	-0.3690176	-0.0482569
25	fall	Condition0.05	0.0307259	-0.2701837	0.5032384
25	fall	Condition0.1	0.0169245	-0.2092840	0.1871476
25	fall	Condition0.2	-0.0681484	-0.4027597	0.0571286
25	fall	Condition2	-0.2408457	-0.4988797	0.0137758
25	huMech0	Condition0.05	-0.2369250	-0.4966709	0.0342586
25	huMech0	Condition0.1	-0.3639754	-0.6141535	-0.1274070
25	huMech0	Condition0.2	-0.6048138	-0.8752584	-0.3721239
25	huMech0	Condition2	-0.5403711	-0.8095553	-0.2800830
25	huMech1	Condition0.05	0.6387020	-1.1163810	2.5643856
25	huMech1	Condition0.1	0.4556694	-0.8493502	1.9969391
25	huMech1	Condition0.2	1.7777987	0.3640710	3.1916440
25	huMech1	Condition2	2.5622354	1.1420562	4.0110930
25	huMech2	Condition0.05	-2.3631669	-6.4738931	1.7409935
25	huMech2	Condition0.1	-1.9225362	-5.2279582	1.1840411
25	huMech2	Condition0.2	-4.3436033	-7.5861103	-1.4082785
25	huMech2	Condition2	-7.1100833	-10.1692978	-4.0409749
25	huMech3	Condition0.05	2.1128268	-0.4443380	4.8389416
25	huMech3	Condition0.1	2.4948525	0.4222807	4.5567414
25	huMech3	Condition0.2	4.4045430	2.3458097	6.5331044

25	huMech3	Condition2	5.9258048	4.0393385	8.0625923
25	low_like	Condition0.05	-0.2369250	-0.4966709	0.0342586
25	low_like	Condition0.1	-0.3639754	-0.6141535	-0.1274070
25	low_like	Condition0.2	-0.6048138	-0.8752584	-0.3721239
25	low_like	Condition2	-0.5403711	-0.8095553	-0.2800830
25	trough	Condition0.05	0.5754054	0.2123606	0.8470484
25	trough	Condition0.1	0.3675366	0.1782584	0.5079089
25	trough	Condition0.2	0.4025896	0.2178326	0.4864326
25	trough	Condition2	0.5186054	0.4102940	0.5888972
25	trough_like	Condition0.05	-0.2431823	-0.6903641	-0.0205089
25	trough_like	Condition0.1	-0.3162175	-0.4881095	-0.1538982
25	trough_like	Condition0.2	-0.3542999	-0.5202179	-0.1925139
25	trough_like	Condition2	-0.2807393	-0.4533348	-0.1308911
26	fall	Condition0.05	0.0460931	-0.2651915	0.4671744
26	fall	Condition0.1	0.0233453	-0.1897868	0.2195310
26	fall	Condition0.2	-0.1156537	-0.3550983	0.1345401
26	fall	Condition2	-0.0895219	-0.3734639	0.1591017
26	huMech0	Condition0.05	-0.2353294	-0.4991032	0.0242385
26	huMech0	Condition0.1	0.0705051	-0.1720740	0.3097940
26	huMech0	Condition0.2	0.0926702	-0.1579588	0.3648047
26	huMech0	Condition2	-0.1310152	-0.3941047	0.1330222
26	huMech1	Condition0.05	0.6770664	-1.1002417	2.5797944
26	huMech1	Condition0.1	0.4677698	-0.8636726	1.9906679
26	huMech1	Condition0.2	1.7056574	0.2533269	3.0726320
26	huMech1	Condition2	2.6178265	1.1716982	4.0065329
26	huMech2	Condition0.05	-2.1926413	-6.4027883	1.8064160
26	huMech2	Condition0.1	-2.2218757	-5.3627772	1.1473338
26	huMech2	Condition0.2	-4.6854747	-7.7471250	-1.5662775
26	huMech2	Condition2	-7.2843362	-10.1928597	-4.0369140
26	huMech3	Condition0.05	2.2244044	-0.4400155	4.8135246
26	huMech3	Condition0.1	2.0237123	-0.0030133	4.1438016
26	huMech3	Condition0.2	3.5045269	1.5318943	5.5904148
26	huMech3	Condition2	5.3755016	3.2122332	7.2477923
26	low_like	Condition0.05	-0.2353294	-0.4991032	0.0242385
26	low_like	Condition0.1	0.0705051	-0.1720740	0.3097940
26	low_like	Condition0.2	0.0926702	-0.1579588	0.3648047
26	low_like	Condition2	-0.1310152	-0.3941047	0.1330222
26	trough	Condition0.05	0.5781399	0.2170588	0.8385053

26	trough	Condition0.1	0.5240678	0.2992809	0.6550127
26	trough	Condition0.2	0.6174720	0.4621846	0.7202521
26	trough	Condition2	0.6611358	0.5740021	0.7309620
26	trough_like	Condition0.05	-0.2175529	-0.6688356	-0.0257692
26	trough_like	Condition0.1	0.0648976	-0.0977171	0.2165301
26	trough_like	Condition0.2	0.2160452	0.0513207	0.3640251
26	trough_like	Condition2	-0.0333006	-0.1872286	0.1382151
27	fall	Condition0.05	0.0368743	-0.2758647	0.4807175
27	fall	Condition0.1	0.0406396	-0.1766428	0.2334815
27	fall	Condition0.2	-0.0552259	-0.3157167	0.1966935
27	fall	Condition2	0.0713553	-0.2148209	0.3746083
27	huMech0	Condition0.05	-0.2436416	-0.4995004	0.0348809
27	huMech0	Condition0.1	-0.1029692	-0.3569387	0.1243117
27	huMech0	Condition0.2	-0.1604349	-0.4158098	0.1259104
27	huMech0	Condition2	-0.0613495	-0.3327812	0.2249646
27	huMech1	Condition0.05	0.6254085	-1.1639078	2.6160053
27	huMech1	Condition0.1	0.4693147	-0.8589371	1.9758609
27	huMech1	Condition0.2	1.7254989	0.2384201	3.0526258
27	huMech1	Condition2	2.3951590	0.8994339	3.7985201
27	huMech2	Condition0.05	-2.3866179	-6.3995500	1.7851000
27	huMech2	Condition0.1	-1.9950331	-5.2798582	1.0943103
27	huMech2	Condition0.2	-4.7341646	-7.7134974	-1.5523800
27	huMech2	Condition2	-7.3478445	-10.2107425	-4.0827347
27	huMech3	Condition0.05	2.3619053	-0.4223237	4.7831200
27	huMech3	Condition0.1	1.9610712	-0.1348013	4.0189862
27	huMech3	Condition0.2	3.3782684	1.3477733	5.4711797
27	huMech3	Condition2	5.3226418	3.1867003	7.2874307
27	low_like	Condition0.05	-0.2436416	-0.4995004	0.0348809
27	low_like	Condition0.1	-0.1029692	-0.3569387	0.1243117
27	low_like	Condition0.2	-0.1604349	-0.4158098	0.1259104
27	low_like	Condition2	-0.0613495	-0.3327812	0.2249646
27	trough	Condition0.05	0.5780147	0.2209145	0.8733411
27	trough	Condition0.1	0.5623972	0.3299447	0.6956794
27	trough	Condition0.2	0.6546368	0.5217880	0.7852995
27	trough	Condition2	0.6960462	0.6299235	0.7665627
27	trough_like	Condition0.05	-0.2268666	-0.7104588	-0.0323995
27	trough_like	Condition0.1	-0.1384205	-0.2874068	0.0119610
27	trough_like	Condition0.2	-0.0753217	-0.2435581	0.0679860

27	trough_like	Condition2	-0.1396269	-0.2940855	0.0246143
28	fall	Condition0.05	0.0417665	-0.2687568	0.4595599
28	fall	Condition0.1	0.0044213	-0.2065826	0.1978467
28	fall	Condition0.2	-0.1020995	-0.3471404	0.1331397
28	fall	Condition2	-0.0270702	-0.3136734	0.2458169
28	huMech0	Condition0.05	-0.2286857	-0.4913983	0.0242159
28	huMech0	Condition0.1	-0.4351513	-0.6678751	-0.1921934
28	huMech0	Condition0.2	-0.3772406	-0.6215638	-0.1167118
28	huMech0	Condition2	-0.3644125	-0.6157939	-0.0888959
28	huMech1	Condition0.05	0.6337388	-1.1207921	2.5459347
28	huMech1	Condition0.1	0.6071960	-0.8722359	1.9441795
28	huMech1	Condition0.2	1.5854043	0.2107475	2.9630253
28	huMech1	Condition2	2.4255558	0.8981666	3.7813777
28	huMech2	Condition0.05	-2.2850805	-6.3935114	1.7516420
28	huMech2	Condition0.1	-1.9723361	-5.2268143	1.1493791
28	huMech2	Condition0.2	-4.6925119	-7.7283124	-1.5410781
28	huMech2	Condition2	-7.2737936	-10.1494324	-4.1147727
28	huMech3	Condition0.05	2.1971552	-0.4165685	4.8688053
28	huMech3	Condition0.1	2.4069086	0.3096949	4.5220027
28	huMech3	Condition0.2	4.0122008	1.8265009	5.9455293
28	huMech3	Condition2	5.5883828	3.5533116	7.6211425
28	low_like	Condition0.05	-0.2286857	-0.4913983	0.0242159
28	low_like	Condition0.1	-0.4351513	-0.6678751	-0.1921934
28	low_like	Condition0.2	-0.3772406	-0.6215638	-0.1167118
28	low_like	Condition2	-0.3644125	-0.6157939	-0.0888959
28	trough	Condition0.05	0.5731161	0.2235712	0.8791651
28	trough	Condition0.1	0.4195666	0.2347291	0.5504724
28	trough	Condition0.2	0.5469559	0.3953026	0.6312034
28	trough	Condition2	0.6315041	0.5559757	0.6961453
28	trough_like	Condition0.05	-0.2337956	-0.7219344	-0.0213103
28	trough_like	Condition0.1	-0.4012054	-0.5653297	-0.2569271
28	trough_like	Condition0.2	-0.2538596	-0.4167878	-0.1003878
28	trough_like	Condition2	-0.3240501	-0.4769902	-0.1531388
29	fall	Condition0.05	0.0148150	-0.2675037	0.4447801
29	fall	Condition0.1	0.0554596	-0.1498607	0.2504924
29	fall	Condition0.2	-0.0585551	-0.3273870	0.1778915
29	fall	Condition2	0.0293453	-0.2332678	0.3101967
29	huMech0	Condition0.05	-0.2279572	-0.4894530	0.0354546

29	huMech0	Condition0.1	-0.0566250	-0.2860347	0.1825273
29	huMech0	Condition0.2	-0.1865211	-0.4407352	0.0784009
29	huMech0	Condition2	-0.2726390	-0.5427893	-0.0052112
29	huMech1	Condition0.05	0.6860524	-1.1456902	2.5517416
29	huMech1	Condition0.1	0.4417622	-0.8620450	1.9385625
29	huMech1	Condition0.2	1.7784149	0.2983547	3.1363036
29	huMech1	Condition2	2.4672077	1.0148894	3.8498689
29	huMech2	Condition0.05	-2.5658799	-6.4576663	1.7777953
29	huMech2	Condition0.1	-2.2161804	-5.3320650	1.1167987
29	huMech2	Condition0.2	-4.5123048	-7.7382528	-1.5185556
29	huMech2	Condition2	-7.2861190	-10.1744835	-4.1522412
29	huMech3	Condition0.05	2.1547808	-0.4510946	4.8623816
29	huMech3	Condition0.1	1.7364153	-0.1775532	4.0010280
29	huMech3	Condition0.2	3.2353321	1.2001982	5.3060825
29	huMech3	Condition2	5.2447006	3.1876115	7.2279349
29	low_like	Condition0.05	-0.2279572	-0.4894530	0.0354546
29	low_like	Condition0.1	-0.0566250	-0.2860347	0.1825273
29	low_like	Condition0.2	-0.1865211	-0.4407352	0.0784009
29	low_like	Condition2	-0.2726390	-0.5427893	-0.0052112
29	trough	Condition0.05	0.5763882	0.2314000	0.8612796
29	trough	Condition0.1	0.5937298	0.3584113	0.7424395
29	trough	Condition0.2	0.6785939	0.5501987	0.8370171
29	trough	Condition2	0.6947191	0.6279968	0.7679762
29	trough_like	Condition0.05	-0.2373825	-0.6857474	-0.0196402
29	trough_like	Condition0.1	-0.1065734	-0.2536919	0.0434100
29	trough_like	Condition0.2	-0.1272247	-0.2602450	0.0454380
29	trough_like	Condition2	-0.3065700	-0.4744885	-0.1479538
3	fall	Condition0.05	0.0223634	-0.2599088	0.2533417
3	fall	Condition0.1	0.0205783	-0.1897090	0.2562166
3	fall	Condition0.2	-0.1144719	-0.3417319	0.1377774
3	fall	Condition2	-0.1245254	-0.3957846	0.1498231
3	huMech0	Condition0.05	-0.2231748	-0.4729726	0.0175735
3	huMech0	Condition0.1	-0.2346528	-0.7476737	0.2544051
3	huMech0	Condition0.2	-0.3412676	-0.5860730	-0.0730904
3	huMech0	Condition2	-0.3156136	-0.5684327	-0.0410636
3	huMech1	Condition0.05	0.7696571	-1.0932391	2.5309207
3	huMech1	Condition0.1	0.5398198	-0.8431218	1.9701662
3	huMech1	Condition0.2	1.6414417	0.1957884	2.9809508

3	huMech1	Condition2	2.6048440	1.1427097	3.9350426
3	huMech2	Condition0.05	-2.5729073	-6.4444912	1.7065081
3	huMech2	Condition0.1	-2.0348127	-5.2364798	1.1229524
3	huMech2	Condition0.2	-4.6906740	-7.7437599	-1.5018345
3	huMech2	Condition2	-7.1387524	-10.1650504	-4.0785144
3	huMech3	Condition0.05	2.1766112	-0.4495160	4.7525220
3	huMech3	Condition0.1	2.2280315	0.0997334	4.4851294
3	huMech3	Condition0.2	3.8340976	1.7069722	5.8554030
3	huMech3	Condition2	5.4288077	3.3337900	7.3857729
3	low_like	Condition0.05	-0.2231748	-0.4729726	0.0175735
3	low_like	Condition0.1	-0.2346528	-0.7476737	0.2544051
3	low_like	Condition0.2	-0.3412676	-0.5860730	-0.0730904
3	low_like	Condition2	-0.3156136	-0.5684327	-0.0410636
3	trough	Condition0.05	0.5804348	0.2840686	0.6787591
3	trough	Condition0.1	0.4430529	0.2129936	0.7827904
3	trough	Condition0.2	0.5630197	0.4255020	0.6579471
3	trough	Condition2	0.6420695	0.5501619	0.7050259
3	trough_like	Condition0.05	-0.2255117	-0.3567987	-0.0854161
3	trough_like	Condition0.1	-0.2336774	-0.7733202	0.2235392
3	trough_like	Condition0.2	-0.2185180	-0.3787611	-0.0669639
3	trough_like	Condition2	-0.1893322	-0.3458784	-0.0235590
30	fall	Condition0.05	0.0210219	-0.2551394	0.4863908
30	fall	Condition0.1	0.0243488	-0.1826240	0.2305697
30	fall	Condition0.2	-0.0059980	-0.2256805	0.2933589
30	fall	Condition2	0.0317858	-0.2408124	0.3174430
30	huMech0	Condition0.05	-0.2356177	-0.4932082	0.0270531
30	huMech0	Condition0.1	-0.0935988	-0.3085807	0.1641434
30	huMech0	Condition0.2	0.1587386	-0.0945591	0.4094142
30	huMech0	Condition2	0.1463548	-0.1278504	0.4109746
30	huMech1	Condition0.05	0.7703164	-1.1318341	2.5346023
30	huMech1	Condition0.1	0.4823278	-0.8745432	1.9374984
30	huMech1	Condition0.2	1.4765509	0.0294206	2.9160480
30	huMech1	Condition2	2.3994528	0.8572424	3.7214843
30	huMech2	Condition0.05	-2.5533082	-6.4371475	1.7639840
30	huMech2	Condition0.1	-2.0357842	-5.3341505	1.0805956
30	huMech2	Condition0.2	-4.8783270	-7.8001090	-1.5865978
30	huMech2	Condition2	-7.2344093	-10.2058154	-4.1028552
30	huMech3	Condition0.05	2.2357866	-0.4679556	4.8553382

30	huMech3	Condition0.1	2.0224042	0.0193084	4.1837767
30	huMech3	Condition0.2	3.7290008	1.6695714	5.6791577
30	huMech3	Condition2	5.3683766	3.3709684	7.4922693
30	low_like	Condition0.05	-0.2356177	-0.4932082	0.0270531
30	low_like	Condition0.1	-0.0935988	-0.3085807	0.1641434
30	low_like	Condition0.2	0.1587386	-0.0945591	0.4094142
30	low_like	Condition2	0.1463548	-0.1278504	0.4109746
30	trough	Condition0.05	0.5788189	0.2325485	0.8660206
30	trough	Condition0.1	0.5387976	0.3108742	0.6535633
30	trough	Condition0.2	0.6426663	0.5228717	0.7442801
30	trough	Condition2	0.6691927	0.6011250	0.7383045
30	trough_like	Condition0.05	-0.2214568	-0.7125029	-0.0269567
30	trough_like	Condition0.1	-0.0754441	-0.2509394	0.0569286
30	trough_like	Condition0.2	0.1471726	-0.0109148	0.3050825
30	trough_like	Condition2	0.1017592	-0.0553618	0.2635442
31	fall	Condition0.05	0.0240688	-0.2744564	0.4617074
31	fall	Condition0.1	0.0236462	-0.1996170	0.2058457
31	fall	Condition0.2	-0.1221437	-0.3578009	0.1194016
31	fall	Condition2	0.1003659	-0.1644945	0.3907400
31	huMech0	Condition0.05	-0.2380853	-0.4952534	0.0303001
31	huMech0	Condition0.1	-0.1085071	-0.3293986	0.1438627
31	huMech0	Condition0.2	-0.1893922	-0.4442015	0.0582444
31	huMech0	Condition2	0.0754581	-0.1864382	0.3455787
31	huMech1	Condition0.05	0.7692697	-1.1722547	2.6024724
31	huMech1	Condition0.1	0.4303919	-0.8809904	1.9487754
31	huMech1	Condition0.2	1.5972473	0.2436136	3.0458843
31	huMech1	Condition2	2.3983133	0.8909488	3.7960662
31	huMech2	Condition0.05	-2.2689576	-6.4531837	1.7995530
31	huMech2	Condition0.1	-2.1512209	-5.2837643	1.1207883
31	huMech2	Condition0.2	-4.6638424	-7.6639874	-1.5236410
31	huMech2	Condition2	-7.1345282	-10.2059566	-4.1446205
31	huMech3	Condition0.05	2.3144858	-0.4576595	4.8855459
31	huMech3	Condition0.1	2.1223800	0.2123565	4.3684852
31	huMech3	Condition0.2	3.6405966	1.6584203	5.7077593
31	huMech3	Condition2	5.1824861	3.1194646	7.1618881
31	low_like	Condition0.05	-0.2380853	-0.4952534	0.0303001
31	low_like	Condition0.1	-0.1085071	-0.3293986	0.1438627
31	low_like	Condition0.2	-0.1893922	-0.4442015	0.0582444

31	low_like	Condition2	0.0754581	-0.1864382	0.3455787
31	trough	Condition0.05	0.5655385	0.2262473	0.8358370
31	trough	Condition0.1	0.4605151	0.2601919	0.5905467
31	trough	Condition0.2	0.5886861	0.4302258	0.6769520
31	trough	Condition2	0.7125915	0.6461854	0.7968905
31	trough_like	Condition0.05	-0.2343711	-0.6888776	-0.0151616
31	trough_like	Condition0.1	-0.0820932	-0.2456317	0.0603038
31	trough_like	Condition0.2	-0.0543996	-0.2175132	0.0884983
31	trough_like	Condition2	-0.0439564	-0.2000921	0.1205820
32	fall	Condition0.05	0.0302400	-0.2603995	0.4650595
32	fall	Condition0.1	0.0224133	-0.2106854	0.1799158
32	fall	Condition0.2	-0.1680607	-0.4515225	0.0562408
32	fall	Condition2	-0.0562514	-0.3359654	0.2168033
32	huMech0	Condition0.05	-0.2241815	-0.4979504	0.0242895
32	huMech0	Condition0.1	-0.2439138	-0.4947420	-0.0203369
32	huMech0	Condition0.2	-0.4221908	-0.6965387	-0.1931502
32	huMech0	Condition2	-0.1209750	-0.3788784	0.1388568
32	huMech1	Condition0.05	0.7116703	-1.1782530	2.6017607
32	huMech1	Condition0.1	0.4700242	-0.8362298	2.0144704
32	huMech1	Condition0.2	1.8389556	0.3678240	3.1632433
32	huMech1	Condition2	2.5267481	1.0572142	4.0197075
32	huMech2	Condition0.05	-2.4732179	-6.4664767	1.7581062
32	huMech2	Condition0.1	-1.9697197	-5.1972508	1.1875263
32	huMech2	Condition0.2	-4.3692339	-7.5848767	-1.4198240
32	huMech2	Condition2	-7.1618415	-10.1838377	-4.0271146
32	huMech3	Condition0.05	2.1544533	-0.4394383	4.8079050
32	huMech3	Condition0.1	2.4390746	0.4770050	4.5861743
32	huMech3	Condition0.2	4.0548389	2.1397405	6.1520837
32	huMech3	Condition2	5.2511163	3.2353102	7.2428336
32	low_like	Condition0.05	-0.2241815	-0.4979504	0.0242895
32	low_like	Condition0.1	-0.2439138	-0.4947420	-0.0203369
32	low_like	Condition0.2	-0.4221908	-0.6965387	-0.1931502
32	low_like	Condition2	-0.1209750	-0.3788784	0.1388568
32	trough	Condition0.05	0.5708854	0.2128894	0.8726108
32	trough	Condition0.1	0.3551732	0.1910614	0.5049467
32	trough	Condition0.2	0.4504964	0.2882640	0.5369034
32	trough	Condition2	0.6667547	0.5907757	0.7449061
32	trough_like	Condition0.05	-0.2389611	-0.6944352	-0.0302117

32	trough_like	Condition0.1	-0.1920362	-0.3622966	-0.0238459
32	trough_like	Condition0.2	-0.1717183	-0.3473260	-0.0329545
32	trough_like	Condition2	-0.0604009	-0.2233882	0.0918312
33	fall	Condition0.05	0.0431363	-0.2680950	0.4550653
33	fall	Condition0.1	0.0191907	-0.1936186	0.1760889
33	fall	Condition0.2	-0.1706782	-0.4468077	0.0604813
33	fall	Condition2	-0.2648960	-0.5367119	-0.0175023
33	huMech0	Condition0.05	-0.2347288	-0.4974055	0.0203655
33	huMech0	Condition0.1	-0.3279710	-0.5665667	-0.1011725
33	huMech0	Condition0.2	-0.5423223	-0.7865237	-0.2822458
33	huMech0	Condition2	-0.4681215	-0.7165778	-0.1868856
33	huMech1	Condition0.05	0.8017471	-1.1623620	2.5374195
33	huMech1	Condition0.1	0.5405249	-0.8376971	2.0207018
33	huMech1	Condition0.2	1.9605579	0.3927950	3.2131357
33	huMech1	Condition2	2.7507527	1.1853102	4.1299476
33	huMech2	Condition0.05	-2.5344592	-6.3774128	1.7662009
33	huMech2	Condition0.1	-1.8904442	-5.1737872	1.2029785
33	huMech2	Condition0.2	-4.4857987	-7.6097344	-1.4189140
33	huMech2	Condition2	-7.0868471	-10.1213282	-3.9965809
33	huMech3	Condition0.05	2.2442663	-0.4316782	4.8159436
33	huMech3	Condition0.1	2.7079742	0.5755168	4.7506647
33	huMech3	Condition0.2	4.3505356	2.2535274	6.3935063
33	huMech3	Condition2	5.9759945	3.9121145	7.9387160
33	low_like	Condition0.05	-0.2347288	-0.4974055	0.0203655
33	low_like	Condition0.1	-0.3279710	-0.5665667	-0.1011725
33	low_like	Condition0.2	-0.5423223	-0.7865237	-0.2822458
33	low_like	Condition2	-0.4681215	-0.7165778	-0.1868856
33	trough	Condition0.05	0.5673021	0.2176536	0.8588851
33	trough	Condition0.1	0.3092741	0.1581283	0.4707524
33	trough	Condition0.2	0.4112364	0.2394673	0.5132573
33	trough	Condition2	0.5177443	0.4062259	0.5875636
33	trough_like	Condition0.05	-0.2422035	-0.6653986	-0.0129774
33	trough_like	Condition0.1	-0.2875598	-0.4395757	-0.1026558
33	trough_like	Condition0.2	-0.2730727	-0.4247131	-0.0779134
33	trough_like	Condition2	-0.1771913	-0.3225822	-0.0040972
34	fall	Condition0.05	0.0276218	-0.2675534	0.4483816
34	fall	Condition0.1	0.0147479	-0.2094804	0.1962823
34	fall	Condition0.2	-0.1474221	-0.3961109	0.0591012

34	fall	Condition2	-0.2084020	-0.4549135	0.0844465
34	huMech0	Condition0.05	-0.2396775	-0.4910856	0.0304622
34	huMech0	Condition0.1	-0.2269035	-0.4468372	0.0243638
34	huMech0	Condition0.2	-0.5649119	-0.8087406	-0.3018484
34	huMech0	Condition2	-0.6434101	-0.8961910	-0.3749580
34	huMech1	Condition0.05	0.8156554	-1.1234683	2.5584239
34	huMech1	Condition0.1	0.5739172	-0.8632756	1.9756190
34	huMech1	Condition0.2	1.6926707	0.2383491	3.0367307
34	huMech1	Condition2	2.6020445	1.0019607	3.8796108
34	huMech2	Condition0.05	-2.5584897	-6.3691988	1.7250106
34	huMech2	Condition0.1	-1.9320530	-5.2608033	1.1520948
34	huMech2	Condition0.2	-4.4070615	-7.6076675	-1.4827197
34	huMech2	Condition2	-7.1501929	-10.1236747	-3.9740074
34	huMech3	Condition0.05	2.1067209	-0.4561254	4.8598060
34	huMech3	Condition0.1	2.1860529	0.0727429	4.2695613
34	huMech3	Condition0.2	4.1742233	2.2551325	6.3379962
34	huMech3	Condition2	6.0675377	3.8827189	7.9107982
34	low_like	Condition0.05	-0.2396775	-0.4910856	0.0304622
34	low_like	Condition0.1	-0.2269035	-0.4468372	0.0243638
34	low_like	Condition0.2	-0.5649119	-0.8087406	-0.3018484
34	low_like	Condition2	-0.6434101	-0.8961910	-0.3749580
34	trough	Condition0.05	0.5791266	0.2055735	0.8363319
34	trough	Condition0.1	0.4950813	0.2743554	0.6147234
34	trough	Condition0.2	0.4602896	0.3088860	0.5499380
34	trough	Condition2	0.5561429	0.4467246	0.6138823
34	trough_like	Condition0.05	-0.2240454	-0.6761678	-0.0363065
34	trough_like	Condition0.1	-0.1974274	-0.3461083	-0.0389137
34	trough_like	Condition0.2	-0.3511248	-0.5114779	-0.1859965
34	trough_like	Condition2	-0.4434056	-0.6039613	-0.2847554
35	fall	Condition0.05	0.0384900	-0.2709422	0.4328607
35	fall	Condition0.1	0.0215452	-0.1590294	0.1847738
35	fall	Condition0.2	-0.0902984	-0.3685708	0.1135904
35	fall	Condition2	-0.1669746	-0.4482943	0.1002331
35	huMech0	Condition0.05	-0.2422802	-0.4921581	0.0248842
35	huMech0	Condition0.1	-0.6727562	-0.9264318	-0.4396920
35	huMech0	Condition0.2	-0.5745248	-0.8230270	-0.3000220
35	huMech0	Condition2	-0.4127207	-0.6730067	-0.1358188
35	huMech1	Condition0.05	0.7832463	-1.2321972	2.5529197

35	huMech1	Condition0.1	0.4593261	-0.8654678	1.9715794
35	huMech1	Condition0.2	1.5877492	0.1503704	2.9898065
35	huMech1	Condition2	2.6826153	1.0882216	4.0050160
35	huMech2	Condition0.05	-2.1735888	-6.4232251	1.7600226
35	huMech2	Condition0.1	-1.8345827	-5.1745336	1.2756172
35	huMech2	Condition0.2	-4.6999153	-7.6639727	-1.4223502
35	huMech2	Condition2	-7.1106966	-10.1362721	-4.0106862
35	huMech3	Condition0.05	2.1442531	-0.4220906	4.7633321
35	huMech3	Condition0.1	2.9025039	0.8402769	5.0243651
35	huMech3	Condition0.2	4.5203670	2.3273052	6.4499220
35	huMech3	Condition2	5.6908810	3.5507668	7.5587570
35	low_like	Condition0.05	-0.2422802	-0.4921581	0.0248842
35	low_like	Condition0.1	-0.6727562	-0.9264318	-0.4396920
35	low_like	Condition0.2	-0.5745248	-0.8230270	-0.3000220
35	low_like	Condition2	-0.4127207	-0.6730067	-0.1358188
35	trough	Condition0.05	0.5656796	0.2384067	0.8567117
35	trough	Condition0.1	0.2927046	0.1193162	0.4200425
35	trough	Condition0.2	0.4481293	0.2988023	0.5272152
35	trough	Condition2	0.6029066	0.4985871	0.6599485
35	trough_like	Condition0.05	-0.2354872	-0.6663868	-0.0150575
35	trough_like	Condition0.1	-0.6101642	-0.8139935	-0.4500317
35	trough_like	Condition0.2	-0.3802190	-0.5633948	-0.2214548
35	trough_like	Condition2	-0.2277277	-0.3910087	-0.0783154
36	fall	Condition0.05	0.0210212	-0.2790950	0.4220946
36	fall	Condition0.1	0.0146715	-0.2151025	0.1814388
36	fall	Condition0.2	-0.1438407	-0.4081129	0.0773037
36	fall	Condition2	-0.2657995	-0.5230195	0.0101639
36	huMech0	Condition0.05	-0.2356493	-0.5001196	0.0329475
36	huMech0	Condition0.1	-0.3187436	-0.5698067	-0.0785868
36	huMech0	Condition0.2	-0.4532149	-0.6967040	-0.1877694
36	huMech0	Condition2	-0.3981018	-0.6618381	-0.1229532
36	huMech1	Condition0.05	0.7410494	-1.1518600	2.5636852
36	huMech1	Condition0.1	0.4572409	-0.8678312	1.9754768
36	huMech1	Condition0.2	1.7089957	0.2468189	3.0807245
36	huMech1	Condition2	2.7706647	1.2400272	4.1275932
36	huMech2	Condition0.05	-2.3383296	-6.4597617	1.7359200
36	huMech2	Condition0.1	-1.8577909	-5.1382253	1.2087615
36	huMech2	Condition0.2	-4.5796433	-7.6496910	-1.4828827

36	huMech2	Condition2	-7.2448860	-10.1293223	-3.9864008
36	huMech3	Condition0.05	2.2481042	-0.4625070	4.8445597
36	huMech3	Condition0.1	2.5796677	0.4712877	4.6376458
36	huMech3	Condition0.2	4.1626789	2.0959381	6.2089472
36	huMech3	Condition2	5.6994268	3.5877056	7.6739315
36	low_like	Condition0.05	-0.2356493	-0.5001196	0.0329475
36	low_like	Condition0.1	-0.3187436	-0.5698067	-0.0785868
36	low_like	Condition0.2	-0.4532149	-0.6967040	-0.1877694
36	low_like	Condition2	-0.3981018	-0.6618381	-0.1229532
36	trough	Condition0.05	0.5616136	0.2079463	0.8356299
36	trough	Condition0.1	0.3380458	0.1758889	0.4924368
36	trough	Condition0.2	0.4642433	0.3235291	0.5567233
36	trough	Condition2	0.5560488	0.4445812	0.6295956
36	trough_like	Condition0.05	-0.2222036	-0.6765744	-0.0167279
36	trough_like	Condition0.1	-0.2585890	-0.4323001	-0.1025995
36	trough_like	Condition0.2	-0.2325258	-0.4041186	-0.0758104
36	trough_like	Condition2	-0.1125371	-0.2878797	0.0384382
37	fall	Condition0.05	0.0517970	-0.2701385	0.4587242
37	fall	Condition0.1	0.0168758	-0.1869799	0.1800180
37	fall	Condition0.2	-0.0783151	-0.3202185	0.1405084
37	fall	Condition2	0.1122551	-0.1673269	0.4274094
37	huMech0	Condition0.05	-0.2426941	-0.4907460	0.0304664
37	huMech0	Condition0.1	-0.4286222	-0.6635431	-0.1846657
37	huMech0	Condition0.2	-0.5313282	-0.8009736	-0.2905840
37	huMech0	Condition2	-0.1916154	-0.4523855	0.0892200
37	huMech1	Condition0.05	0.6607417	-1.1657303	2.5699860
37	huMech1	Condition0.1	0.5319259	-0.8513651	1.9674319
37	huMech1	Condition0.2	1.4550915	0.0205985	2.9193023
37	huMech1	Condition2	1.8479444	0.3832856	3.3220871
37	huMech2	Condition0.05	-2.3968793	-6.3807432	1.7430037
37	huMech2	Condition0.1	-1.8565113	-5.1896674	1.2329874
37	huMech2	Condition0.2	-4.5560138	-7.5801278	-1.3593963
37	huMech2	Condition2	-7.0476208	-10.1812455	-4.0361176
37	huMech3	Condition0.05	2.3414598	-0.4308146	4.7818736
37	huMech3	Condition0.1	2.6472671	0.6840812	4.7630494
37	huMech3	Condition0.2	4.8196503	2.7211868	6.8162597
37	huMech3	Condition2	5.9624095	4.1031198	8.1575887
37	low_like	Condition0.05	-0.2426941	-0.4907460	0.0304664

37	low_like	Condition0.1	-0.4286222	-0.6635431	-0.1846657
37	low_like	Condition0.2	-0.5313282	-0.8009736	-0.2905840
37	low_like	Condition2	-0.1916154	-0.4523855	0.0892200
37	trough	Condition0.05	0.5714955	0.2286464	0.8640875
37	trough	Condition0.1	0.3092481	0.1548125	0.4521023
37	trough	Condition0.2	0.3992859	0.2716703	0.4859130
37	trough	Condition2	0.6140166	0.5449573	0.6627361
37	trough_like	Condition0.05	-0.2270251	-0.7072599	-0.0134375
37	trough_like	Condition0.1	-0.3624220	-0.5449560	-0.2028267
37	trough_like	Condition0.2	-0.3847517	-0.5480938	-0.2069702
37	trough_like	Condition2	-0.3009770	-0.4700411	-0.1243284
38	fall	Condition0.05	0.0487942	-0.2611402	0.4663254
38	fall	Condition0.1	0.0141986	-0.2124539	0.1845388
38	fall	Condition0.2	-0.2021456	-0.4353842	0.0354529
38	fall	Condition2	-0.0364462	-0.2848974	0.2629347
38	huMech0	Condition0.05	-0.2464889	-0.4856292	0.0352846
38	huMech0	Condition0.1	-0.6211412	-0.8790394	-0.3950091
38	huMech0	Condition0.2	-0.3497053	-0.6133217	-0.1084571
38	huMech0	Condition2	-0.4207903	-0.6654549	-0.1419860
38	huMech1	Condition0.05	0.7000071	-1.1667923	2.6028161
38	huMech1	Condition0.1	0.4846581	-0.8646565	1.9952492
38	huMech1	Condition0.2	1.8866168	0.4127704	3.2121031
38	huMech1	Condition2	2.6561225	1.0522565	3.9505732
38	huMech2	Condition0.05	-2.3951903	-6.3546207	1.7481741
38	huMech2	Condition0.1	-2.0817140	-5.1916982	1.1841419
38	huMech2	Condition0.2	-4.5780203	-7.7061594	-1.4576878
38	huMech2	Condition2	-7.1369659	-10.1916355	-4.1124628
38	huMech3	Condition0.05	2.3783910	-0.4161237	4.8433438
38	huMech3	Condition0.1	2.5225704	0.4663542	4.6818826
38	huMech3	Condition0.2	3.7204954	1.6099066	5.7739335
38	huMech3	Condition2	5.0670542	3.2027313	7.2189203
38	low_like	Condition0.05	-0.2464889	-0.4856292	0.0352846
38	low_like	Condition0.1	-0.6211412	-0.8790394	-0.3950091
38	low_like	Condition0.2	-0.3497053	-0.6133217	-0.1084571
38	low_like	Condition2	-0.4207903	-0.6654549	-0.1419860
38	trough	Condition0.05	0.5549966	0.2354885	0.8455531
38	trough	Condition0.1	0.3454049	0.1952698	0.5007289
38	trough	Condition0.2	0.5338383	0.3878896	0.6309096

38	trough	Condition2	0.6854992	0.6099855	0.7667184
38	trough_like	Condition0.05	-0.2405626	-0.6834016	-0.0185911
38	trough_like	Condition0.1	-0.5814037	-0.7525718	-0.4212824
38	trough_like	Condition0.2	-0.1354880	-0.2902269	0.0241719
38	trough_like	Condition2	-0.3985276	-0.5596926	-0.2398880
39	fall	Condition0.05	0.0472824	-0.2569226	0.4490129
39	fall	Condition0.1	0.0328599	-0.1966165	0.2115759
39	fall	Condition0.2	-0.0794621	-0.3347856	0.1825909
39	fall	Condition2	0.0367047	-0.2228692	0.3391549
39	huMech0	Condition0.05	-0.2443926	-0.4929612	0.0294527
39	huMech0	Condition0.1	-0.1236817	-0.3907708	0.0909014
39	huMech0	Condition0.2	-0.2978079	-0.5476149	-0.0253892
39	huMech0	Condition2	-0.2041324	-0.4790431	0.0479772
39	huMech1	Condition0.05	0.7737240	-1.1376453	2.5796858
39	huMech1	Condition0.1	0.5385267	-0.8642356	1.9830837
39	huMech1	Condition0.2	1.7323316	0.2557352	3.1053299
39	huMech1	Condition2	2.5612710	0.9813425	3.8438940
39	huMech2	Condition0.05	-2.3839687	-6.4094280	1.7367169
39	huMech2	Condition0.1	-2.0967861	-5.3072391	1.1556601
39	huMech2	Condition0.2	-4.6851049	-7.7266817	-1.6042292
39	huMech2	Condition2	-7.2850961	-10.2017068	-4.0644917
39	huMech3	Condition0.05	2.4506381	-0.4540746	4.8072519
39	huMech3	Condition0.1	1.9990444	-0.0535184	4.0887747
39	huMech3	Condition0.2	3.4463148	1.4494945	5.4903836
39	huMech3	Condition2	5.0813891	3.0782308	7.1381501
39	low_like	Condition0.05	-0.2443926	-0.4929612	0.0294527
39	low_like	Condition0.1	-0.1236817	-0.3907708	0.0909014
39	low_like	Condition0.2	-0.2978079	-0.5476149	-0.0253892
39	low_like	Condition2	-0.2041324	-0.4790431	0.0479772
39	trough	Condition0.05	0.5704219	0.2181477	0.8270274
39	trough	Condition0.1	0.5448183	0.3084004	0.6731709
39	trough	Condition0.2	0.6309968	0.4825333	0.7482695
39	trough	Condition2	0.7050260	0.6423847	0.7908852
39	trough_like	Condition0.05	-0.2281686	-0.6717872	-0.0215251
39	trough_like	Condition0.1	-0.1427577	-0.3055138	-0.0010178
39	trough_like	Condition0.2	-0.2171551	-0.3542188	-0.0557531
39	trough_like	Condition2	-0.2685563	-0.4339891	-0.1163174
4	fall	Condition0.05	-0.0050854	-0.2805115	0.2440098

4	fall	Condition0.1	0.0166350	-0.2031224	0.2776192
4	fall	Condition0.2	-0.1544508	-0.3688809	0.0981379
4	fall	Condition2	-0.2341427	-0.5518093	0.0128285
4	huMech0	Condition0.05	-0.2517537	-0.5187863	-0.0214752
4	huMech0	Condition0.1	-0.2828780	-0.7155707	0.2385555
4	huMech0	Condition0.2	-0.1821932	-0.4507919	0.0519818
4	huMech0	Condition2	-0.2701665	-0.5242370	0.0104327
4	huMech1	Condition0.05	0.7762214	-1.1290003	2.5231377
4	huMech1	Condition0.1	0.4522607	-0.8688915	1.9731403
4	huMech1	Condition0.2	1.7565326	0.2941441	3.1264480
4	huMech1	Condition2	3.0005885	1.4820920	4.4041171
4	huMech2	Condition0.05	-2.3536235	-6.2843784	1.9000068
4	huMech2	Condition0.1	-1.9896358	-5.2248100	1.1292699
4	huMech2	Condition0.2	-4.4885060	-7.6592039	-1.5326322
4	huMech2	Condition2	-7.0920679	-10.1701129	-4.0652708
4	huMech3	Condition0.05	2.3555547	-0.3592445	4.8782526
4	huMech3	Condition0.1	2.2593668	0.1340300	4.4655242
4	huMech3	Condition0.2	3.7225470	1.5994138	5.7439275
4	huMech3	Condition2	4.8540551	2.9180398	6.9847025
4	low_like	Condition0.05	-0.2517537	-0.5187863	-0.0214752
4	low_like	Condition0.1	-0.2828780	-0.7155707	0.2385555
4	low_like	Condition0.2	-0.1821932	-0.4507919	0.0519818
4	low_like	Condition2	-0.2701665	-0.5242370	0.0104327
4	trough	Condition0.05	0.5034686	0.2366450	0.6208331
4	trough	Condition0.1	0.4411981	0.2115796	0.7745866
4	trough	Condition0.2	0.5782192	0.4265595	0.6783416
4	trough	Condition2	0.6653366	0.5581982	0.7504993
4	trough_like	Condition0.05	-0.2395653	-0.3828358	-0.0972442
4	trough_like	Condition0.1	-0.2730504	-0.7613008	0.2064800
4	trough_like	Condition0.2	-0.0461157	-0.1963804	0.1215105
4	trough_like	Condition2	-0.0017566	-0.1575019	0.1730250
5	fall	Condition0.05	0.0200821	-0.3850596	0.2039348
5	fall	Condition0.1	0.0228987	-0.1850500	0.2810535
5	fall	Condition0.2	-0.0388857	-0.3525817	0.2587417
5	fall	Condition2	-0.0495278	-0.3573721	0.2346728
5	huMech0	Condition0.05	-0.2168483	-0.4684166	0.0283045
5	huMech0	Condition0.1	-0.2832905	-0.7721618	0.2416709
5	huMech0	Condition0.2	0.1364210	-0.1492925	0.4263676

5	huMech0	Condition2	-0.1871272	-0.4532618	0.0920984
5	huMech1	Condition0.05	0.9066412	-0.9376507	2.7530727
5	huMech1	Condition0.1	0.5435702	-0.8646138	1.9676653
5	huMech1	Condition0.2	1.9400850	0.4667515	3.3482795
5	huMech1	Condition2	2.7542416	1.2646060	4.1646574
5	huMech2	Condition0.05	-2.3316428	-6.2976395	1.9113713
5	huMech2	Condition0.1	-1.9950331	-5.3203369	1.1569146
5	huMech2	Condition0.2	-4.8306473	-7.7094721	-1.6096955
5	huMech2	Condition2	-7.0831066	-10.2491325	-4.0973270
5	huMech3	Condition0.05	2.1553910	-0.3840966	4.8627574
5	huMech3	Condition0.1	2.2839414	0.1799892	4.3957611
5	huMech3	Condition0.2	2.9706579	0.9164603	5.0012213
5	huMech3	Condition2	4.8352716	2.8787581	6.9141220
5	low_like	Condition0.05	-0.2168483	-0.4684166	0.0283045
5	low_like	Condition0.1	-0.2832905	-0.7721618	0.2416709
5	low_like	Condition0.2	0.1364210	-0.1492925	0.4263676
5	low_like	Condition2	-0.1871272	-0.4532618	0.0920984
5	trough	Condition0.05	0.4172729	0.0532247	0.5668480
5	trough	Condition0.1	0.4478532	0.2152466	0.7757220
5	trough	Condition0.2	0.7506687	0.6231210	1.0923300
5	trough	Condition2	0.7177136	0.6430190	0.8272264
5	trough_like	Condition0.05	-0.1162311	-0.2603479	0.0614681
5	trough_like	Condition0.1	-0.2648421	-0.7939607	0.2330778
5	trough_like	Condition0.2	0.1892281	0.0029832	0.3419048
5	trough_like	Condition2	-0.1245870	-0.2819794	0.0388389
6	fall	Condition0.05	0.0197568	-0.2674482	0.2558821
6	fall	Condition0.1	0.0160694	-0.1935927	0.2529339
6	fall	Condition0.2	-0.1062607	-0.3279544	0.1659746
6	fall	Condition2	0.1157805	-0.1718608	0.4051163
6	huMech0	Condition0.05	-0.2504219	-0.4921423	0.0009113
6	huMech0	Condition0.1	-0.2779531	-0.7453221	0.2262352
6	huMech0	Condition0.2	-0.4373352	-0.6739885	-0.1638151
6	huMech0	Condition2	-0.1248072	-0.3626960	0.1819963
6	huMech1	Condition0.05	0.7194582	-1.1651118	2.4901019
6	huMech1	Condition0.1	0.4446462	-0.8456960	1.9871769
6	huMech1	Condition0.2	1.6174363	0.0651842	2.9307325
6	huMech1	Condition2	2.1583212	0.7958452	3.6995709
6	huMech2	Condition0.05	-2.5400482	-6.2980742	1.7949994

6	huMech2	Condition0.1	-2.0297824	-5.2656969	1.1961280
6	huMech2	Condition0.2	-4.6722798	-7.7429003	-1.5377978
6	huMech2	Condition2	-7.2052618	-10.2201517	-4.0776600
6	huMech3	Condition0.05	2.4249323	-0.3421466	4.9251112
6	huMech3	Condition0.1	2.3746162	0.1299803	4.4690963
6	huMech3	Condition0.2	4.1521790	2.1862135	6.1259525
6	huMech3	Condition2	5.3653213	3.4262457	7.4189765
6	low_like	Condition0.05	-0.2504219	-0.4921423	0.0009113
6	low_like	Condition0.1	-0.2779531	-0.7453221	0.2262352
6	low_like	Condition0.2	-0.4373352	-0.6739885	-0.1638151
6	low_like	Condition2	-0.1248072	-0.3626960	0.1819963
6	trough	Condition0.05	0.5203415	0.2534915	0.6319506
6	trough	Condition0.1	0.4617624	0.2199714	0.7498697
6	trough	Condition0.2	0.5226134	0.3664718	0.5976439
6	trough	Condition2	0.6863833	0.6215630	0.7507175
6	trough_like	Condition0.05	-0.2276447	-0.3660920	-0.0826942
6	trough_like	Condition0.1	-0.2646060	-0.7515913	0.2279825
6	trough_like	Condition0.2	-0.3216770	-0.4940907	-0.1636300
6	trough_like	Condition2	-0.2100831	-0.3697804	-0.0485970
7	fall	Condition0.05	0.0205682	-0.2258468	0.2855884
7	fall	Condition0.1	0.0233804	-0.2031783	0.2815014
7	fall	Condition0.2	0.1491590	-0.1148077	0.4252131
7	fall	Condition2	0.3974560	0.1216017	0.7185222
7	huMech0	Condition0.05	-0.2147094	-0.4627073	0.0270328
7	huMech0	Condition0.1	-0.2687206	-0.7171168	0.2455768
7	huMech0	Condition0.2	-0.1400456	-0.3777154	0.1454167
7	huMech0	Condition2	-0.0236343	-0.2877740	0.2510205
7	huMech1	Condition0.05	0.6088770	-1.1449039	2.4589336
7	huMech1	Condition0.1	0.5288805	-0.8386201	1.9898479
7	huMech1	Condition0.2	1.4826143	-0.0019306	2.8381043
7	huMech1	Condition2	2.1069051	0.5999536	3.5088930
7	huMech2	Condition0.05	-2.3273116	-6.5050543	1.6937347
7	huMech2	Condition0.1	-1.9027363	-5.3129782	1.1472716
7	huMech2	Condition0.2	-4.7847244	-7.8126964	-1.6052174
7	huMech2	Condition2	-7.2179971	-10.3305414	-4.1736559
7	huMech3	Condition0.05	2.2182006	-0.4752288	4.7494015
7	huMech3	Condition0.1	2.3420198	0.1381505	4.4693213
7	huMech3	Condition0.2	3.3295777	1.3708295	5.4275184

7	huMech3	Condition2	5.0379160	2.9528680	7.0443069
7	low_like	Condition0.05	-0.2147094	-0.4627073	0.0270328
7	low_like	Condition0.1	-0.2687206	-0.7171168	0.2455768
7	low_like	Condition0.2	-0.1400456	-0.3777154	0.1454167
7	low_like	Condition2	-0.0236343	-0.2877740	0.2510205
7	trough	Condition0.05	0.6027017	0.3325123	0.7068033
7	trough	Condition0.1	0.4467325	0.2177401	0.7813841
7	trough	Condition0.2	0.7208713	0.6351431	0.8758338
7	trough	Condition2	0.7892439	0.7240105	0.8950374
7	trough_like	Condition0.05	-0.2468040	-0.3853472	-0.0922379
7	trough_like	Condition0.1	-0.2799807	-0.7349477	0.2163009
7	trough_like	Condition0.2	-0.2605037	-0.4231305	-0.0912633
7	trough_like	Condition2	-0.4370919	-0.5967177	-0.2704436
8	fall	Condition0.05	-0.0169074	-0.2739939	0.2589052
8	fall	Condition0.1	0.0321853	-0.2086562	0.2774843
8	fall	Condition0.2	-0.1109047	-0.3436856	0.1293161
8	fall	Condition2	-0.2299143	-0.4978023	0.0368353
8	huMech0	Condition0.05	-0.2242506	-0.4675954	0.0247128
8	huMech0	Condition0.1	-0.2332856	-0.7555936	0.2420636
8	huMech0	Condition0.2	-0.7238055	-0.9476344	-0.4526434
8	huMech0	Condition2	-0.6829981	-0.9620498	-0.4300743
8	huMech1	Condition0.05	0.7145381	-1.0639448	2.5377798
8	huMech1	Condition0.1	0.5934270	-0.8672636	1.9694758
8	huMech1	Condition0.2	1.5488786	0.1081936	2.8957629
8	huMech1	Condition2	2.6441021	1.0525461	3.9727659
8	huMech2	Condition0.05	-2.5268705	-6.4017115	1.7234735
8	huMech2	Condition0.1	-2.1867730	-5.2625394	1.1501712
8	huMech2	Condition0.2	-4.3786898	-7.6580530	-1.4940054
8	huMech2	Condition2	-7.2360956	-10.0927901	-3.9363210
8	huMech3	Condition0.05	2.0857812	-0.4736999	4.7123267
8	huMech3	Condition0.1	2.2945019	0.1580587	4.4435822
8	huMech3	Condition0.2	4.5320044	2.4674130	6.5589484
8	huMech3	Condition2	6.0098055	3.9664644	8.0434123
8	low_like	Condition0.05	-0.2242506	-0.4675954	0.0247128
8	low_like	Condition0.1	-0.2332856	-0.7555936	0.2420636
8	low_like	Condition0.2	-0.7238055	-0.9476344	-0.4526434
8	low_like	Condition2	-0.6829981	-0.9620498	-0.4300743
8	trough	Condition0.05	0.5678361	0.2684072	0.6754480

8	trough	Condition0.1	0.4504376	0.2203715	0.7733459
8	trough	Condition0.2	0.4450402	0.2926483	0.5282819
8	trough	Condition2	0.5295598	0.4106087	0.5944562
8	trough_like	Condition0.05	-0.1966207	-0.3458129	-0.0642165
8	trough_like	Condition0.1	-0.2830004	-0.7905866	0.2248389
8	trough_like	Condition0.2	-0.5535501	-0.7083716	-0.3809535
8	trough_like	Condition2	-0.4527029	-0.6146764	-0.2930222
9	fall	Condition0.05	0.0309294	-0.2419791	0.2728740
9	fall	Condition0.1	0.0169290	-0.1943152	0.2577236
9	fall	Condition0.2	0.0745893	-0.1774374	0.3743589
9	fall	Condition2	0.0552968	-0.2088061	0.3730194
9	huMech0	Condition0.05	-0.2411321	-0.4753890	0.0129591
9	huMech0	Condition0.1	-0.2593357	-0.7270232	0.2370587
9	huMech0	Condition0.2	-0.0344973	-0.2763323	0.2845519
9	huMech0	Condition2	-0.1214841	-0.3726293	0.1872000
9	huMech1	Condition0.05	0.7035906	-1.1295351	2.5458646
9	huMech1	Condition0.1	0.4568801	-0.8654669	1.9671385
9	huMech1	Condition0.2	1.4418281	-0.0296808	2.8384646
9	huMech1	Condition2	2.2479571	0.6347916	3.5814275
9	huMech2	Condition0.05	-2.5625502	-6.4493424	1.7173474
9	huMech2	Condition0.1	-2.1589602	-5.2935868	1.1991209
9	huMech2	Condition0.2	-4.5955232	-7.7705189	-1.5832467
9	huMech2	Condition2	-7.1402669	-10.1518655	-4.0360681
9	huMech3	Condition0.05	2.1977017	-0.4897906	4.7365333
9	huMech3	Condition0.1	2.1621742	0.1590487	4.4222844
9	huMech3	Condition0.2	3.6365466	1.4731440	5.5750168
9	huMech3	Condition2	5.6804006	3.6642538	7.7371883
9	low_like	Condition0.05	-0.2411321	-0.4753890	0.0129591
9	low_like	Condition0.1	-0.2593357	-0.7270232	0.2370587
9	low_like	Condition0.2	-0.0344973	-0.2763323	0.2845519
9	low_like	Condition2	-0.1214841	-0.3726293	0.1872000
9	trough	Condition0.05	0.5844999	0.3007590	0.7029289
9	trough	Condition0.1	0.4382924	0.2175771	0.7713506
9	trough	Condition0.2	0.6915940	0.5796659	0.8032762
9	trough	Condition2	0.6429720	0.5719037	0.6976420
9	trough_like	Condition0.05	-0.2370801	-0.3769620	-0.0977139
9	trough_like	Condition0.1	-0.2276670	-0.7639940	0.2020586
9	trough_like	Condition0.2	-0.0965417	-0.2499198	0.0548959

9	trough_like	Condition2	-0.1800871	-0.3375837	-0.0132580