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The impact of past and present preferences on stimulus engagement in nursing home residents with dementia

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Abstract

Objectives—We examined engagement with stimuli in 193 nursing home residents with dementia. We hypothesized that activities and stimuli based on a person's past and current preferences would result in more engagement than other activities/stimuli.

Method—The expanded version of the self-identity questionnaire [Cohen-Mansfield, J., Golander, H. & Arheim, G. (2000)] was used to determine participants' past/present interests (as reported by relatives) in the following areas: art, music, babies, pets, reading, television, and office work. We utilized the observational measurement of engagement (Cohen-Mansfield, J., Dakheel-Ali, M., & Marx, M.S. (2009)).

Results—Analysis revealed that residents with current interests in music, art, and pets were more engaged by stimuli that reflect these interests than residents without these interests.

Conclusion—Our findings demonstrate the utility of determining a person's preferences for stimuli in order to predict responsiveness. Lack of prediction for some stimuli may reflect differences between past preferences and activities that are feasible in the present.

Keywords

dementia; engagement; nursing home residents; preferences

Introduction

In spite of evidence that involvement in meaningful social activities is beneficial to persons with dementia (Gonzalez-Salvador et al., 2000), nursing home residents with dementia spend the majority of their time not engaged in any kind of activity (Burgio et al., 1994; Cohen-Mansfield, Marx, & Werner, 1992). The results of four collaborative studies on behavioral outcomes in Dementia Special Care Units found residents to be unoccupied 85% of the time (Logsdon, 2000). Dementia-related behaviors, such as screaming, wandering,

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and physical aggression are most likely to occur during periods of unoccupied time or of boredom (Cohen-Mansfield et al., 1992). Researchers have found that providing appropriate activities for persons with dementia not only engages these persons but also reduces negative behaviors (Cohen-Mansfield, Libin, & Marx, 2007). Although it can be challenging to involve persons with dementia in activities, taking an individualized approach to each person and formulating activities based on past preferences may be effective in increasing engagement.

Cohen-Mansfield, Dakheel-Ali, and Marx (2009) have developed a theoretical framework of engagement that considers how engagement with a stimulus is impacted by stimulus attributes, personal attributes, and setting characteristics, and how engagement impacts affect, and in turn, manifestations of behavior problems. This theoretical framework is the premise of the current article, in which we examine the role of activities and stimuli that are based on a person's past and present interests. It thus explores the effect of person–stimulus interaction on the engagement of persons with dementia. Exploration of this framework is a stepwise process, and future articles will examine the other facets of the framework.

Research has demonstrated that past interest in an activity or stimulus can play a significant role in engagement. In particular, activities relating to self-identity (e.g., occupation or family role) can successfully promote involvement, decrease agitation, increase positive emotional responses, and reduce disorientation (Cohen-Mansfield, Parpura-Gill, & Golander, 2006a). Small, Geldart, Gutman, and Scott (1998) found that personalized interactions between staff members and residents elicited more involvement and cooperative responses by residents than did nonpersonalized interactions. In a study on the effects of personalized, nonpharmacological interventions on agitation, Cohen-Mansfield et al. (2007) found that such interventions resulted in statistically significant decreases in overall agitation in the intervention group relative to the control group. In addition, these individualized interventions resulted in statistically significant increases in pleasure and interest. In this study, we hypothesized that for nursing home residents with dementia, activities and stimuli that are based on a person's past and current preferences would result in more engagement than would other activities and stimuli. We examined the following areas of past/present interest: art, music, babies, pets, reading, television, and office work. Unlike our prior work (Cohen-Mansfield, Golander, & Arnheim, 2000; Cohen-Mansfield et al., 2006a, b) in which we examined the impact of individualizing stimuli for each person (which is probably the optimal approach), in this work we examined standardized stimuli, which can potentially be presented to nursing home residents. Indeed, we also included other standardized stimuli, such as a squeeze ball, a tetherball, an expanding sphere, an activity pillow, or a puzzle. For those stimuli, however, we did not conceive of a similar type of stimulation for which a person may or may not have an affinity prior to the onset of dementia. Therefore, the question about past and present attitude towards the stimuli was limited to stimuli where such attitude would possibly be known to the informant caregiver.

Methods

Participants

Participants were 193 residents of seven Maryland nursing homes. All participants had a diagnosis of dementia. One hundred and fifty-one participants were female (78%), and age averaged 86 years, ranging from 60 to 101 years. The majority of participants was Caucasian (81%), and most were widowed (65%). Activities of daily living (ADL) performance, which was obtained through the Minimum Data Set (MDS; Morris, Hawes, Murphy, & Nonemaker, 1991), averaged 3.6 (SD 1.0, range 1–5; Scale: 1 – 'independent' to 5 – 'complete dependence'). Cognitive functioning, as assessed via the Mini-Mental State

Examination (MMSE; Folstein, Folstein, & McHugh, 1975), averaged 7.2 (SD 6.3, range 0–23). Participants had an average of 6.7 medical diagnoses.

Assessments

Background assessment—Data pertaining to background variables were retrieved from the residents' charts at the nursing homes by a trained research assistant; this included information about gender, age, marital status, medical information (medical conditions from which the resident suffers; a list of medications taken), and performance of ADL from the MDS (Morris et al., 1991). ADL performance was assessed for 10 activities (bed mobility, transferring, locomotion on the unit, dressing, eating, toilet use, personal hygiene, bathing, bladder incontinence, and bowel incontinence) utilizing a scale from 1 to 5, with 5 representing maximum dependence; a mean ADL score was calculated for each participant. All participants had a diagnosis of a major degenerative disease of late life such as: Dementia – probable Alzheimer's disease; Dementia – possible Alzheimer's disease; Dementia – with the presence of vascular disorder (e.g., multi-infarct dementia); Dementia — with a diagnosis of Parkinson's disease; and Dementia – unknown etiology (i.e., cognitive impairment in an alert person that fits none of the categories above). The MMSE (Folstein et al., 1975) was administered to each participant by a research assistant who was trained with regard to standardized administration and scoring procedures.

Self-Identity Questionnaire—A phone interview was conducted with the closest relative to determine which activities had been enjoyed in the past and which are presently enjoyed using portions of the Self-Identity Questionnaire (SIQ; Cohen-Mansfield et al., 2000). The SIQ explores the following four self-identity role domains: professional, family/social, hobbies/leisure time activities, and personal attributes/traits/achievements. For family informants, Cronbach alphas for professional, family, hobbies/leisure time activities, and attributes/traits/achievements role identity scales were 0.82, 0.83, 0.82, and 0.84, respectively (Cohen-Mansfield et al., 2006a). Test–retest reliability of the SIQ was performed for a subset of 10 family members and averaged 86.7% (Cohen-Mansfield et al., 2006a). Informant responses to the hobbies/leisure time activities section of the SIQ were used to determine whether or not the study participants had enjoyed activities in the following categories in the past and/or currently enjoy them in the present: art, music, babies, pets, reading, television, and office work.

Observational Measurement of Engagement—Observational Measurement of Engagement (OME) data were recorded through direct observations using specially designed software installed on a handheld computer, the Palm One Zire 31™. Following our introduction of the engagement stimulus, we recorded whenever the participant refused the engagement stimulus (through words or actions) as well as whether or not the participant asked for additional help and/or modeling of the appropriate usage of the stimulus. Specific outcome variables on the OME are described below:

Duration, referred to the amount of time that the participant was engaged with the stimulus, as observed by visually focusing on the stimulus, being physically occupied with the stimulus, turning body toward the stimulus or changing body position or handling of the stimulus. This measure started after presentation of the engagement stimulus. Each trial lasted a minimum of 3 min and a maximum of 15 min; between these times, the trial was terminated 30 s after the study participant no longer showed engagement with the stimulus. Duration was measured in seconds.

Attention, to the stimulus during an engagement trial was measured on this 4-point scale: not attentive, somewhat attentive, attentive, and very attentive. Attentive behaviors include any

that show the study participant is focused on the stimulus, i.e., eye tracking, visual scanning, facial, motoric or verbal feedback, eye contact, or touching the stimulus. Level of attention observed during most of the trial and the highest attention level during the trial were recorded. Based on high correlations suggesting these capture a single construct (Cohen-Mansfield et al., 2009), these ratings were averaged to form a single attention variable.

Attitude, to the stimulus during an engagement trial was measured on a 7-point scale: very negative, negative, somewhat negative, neutral, somewhat positive, positive, and very positive. Behaviors indicating a particular attitude include positive or negative facial expression, verbal content or physical movement toward the stimulus. Examples of indicators of positive attitude include smiling, laughing, or other outward manifestations of happiness. A negative attitude can be seen when a participant aggressively pushes or throws the stimulus away, curses, manifests frustration towards the stimulus, or tries to get away from the stimulus. We recorded attitude that the participant demonstrated toward the stimulus during most of the trial as well as the highest rating of attitude observed during the trial. Based on high correlations suggesting these capture a single construct (Cohen-Mansfield et al., 2009), these ratings were averaged to form a single attitude variable.

Inter-rater reliability of the OME was assessed by six dyads of research assistants' ratings of the engagement measures during 50 engagement sessions with nursing home residents. The inter-rater agreement rate (for exact agreement) averaged 69%, and ICC values averaged 0.78 for the engagement outcome measures.

Procedure

Informed consent was obtained for all study participants from their relatives or other responsible parties. Additional information on the informed consent process is available elsewhere (Cohen-Mansfield, Kerin, Pawlson, Lipson, & Holdridge, 1988). Our main criterion for inclusion was a diagnosis of dementia (derived from either the medical chart or the attending physician) based on DSM-IV criteria and the report of the NINCDS-ADRDA. The criteria for exclusion were:

- The resident had an accompanying diagnosis of bipolar disorder or schizophrenia.
- The resident had no dexterity of movement in either hand.
- The resident could not be seated in a chair or wheelchair.
- The resident was younger than 60 years of age.

Once consent was obtained for eligible participants, background information was obtained from each participant's chart in the nursing home. In addition, the MMSE was administered to each participant. Each study participant was presented with the engagement stimuli over a period of 3 weeks (approximately four stimuli per day). In order to reflect past and present interests, the following seven categories of stimuli from the SIQ included: (1) Interest in babies – a life-like doll, a childish-looking doll; (2) Interest in office work – sorting envelopes or cards, stamping envelopes; (3) Interest in pets – a robotic animal (\$78 from a store such as Toys R' Us), a plush animal, a real dog (with a handler); (4) Interest in watching television – a respite video (Hall & Hare, 1997; Lund, Hill, Casterta, & Wright, 1995); (5) Interest in reading – large print magazine (Reader's Digest large print edition); (6) Interest in art – coloring with markers; (7) Interest in listening to music – prerecorded music.

At the start of each engagement trial, a research assistant asked if the participant would like to engage in the activity. The research assistant waited to see if the study participant asked questions or needed modeling of the stimulus or if the study participant refused the stimulus. This information was recorded on the OME after the research assistant left the room.

Engagement trials took place between 9:30 am and 12:30 pm and between 2:00 pm and 5:30 pm, as these are the times that residents are not usually occupied with care activities at the nursing home (e.g., meals in the dining room, bathing). Individual engagement trials were separated by a washout period of at least 5 min. The order of stimulus presentation was randomized for each participant.

A second research assistant, who remained unobtrusive, observed the participant's reaction and engagement with the stimulus via the OME, entering the data directly onto a Palm Pilot Zire31™. As described earlier, the OME included items measuring the participant's attention to the stimulus during engagement, attitude toward the stimulus, duration of engagement, manifestations of disruptive behaviors while engaged with the stimulus, activities during engagement (such as manipulating the stimulus), and content as well as target of talk during an engagement trial. Each trial lasted a minimum of 3 min. If the participant showed no interest in the stimulus after 3 min, the trial was terminated and the research assistant retrieved the engagement stimulus. If the participant became engaged with the stimulus, the trial lasted throughout the extent of the participant's engagement – up to a cutoff time of 15 min. When it appeared that the study participant was no longer engaged (for those trials that lasted more than 3 min), the research assistant continued to observe the study participant, ending the trial after 30 s if the study participant showed no further engagement. The research assistants were blind to the study hypothesis.

Analytic approach

Dependent measures were duration, attention, and attitude. When a study participant refused a stimulus, we coded duration as 0 s and scored both the attention and attitude variables as missing for that trial for the purpose of analysis.

In order to examine the role of past interests on the dependent measures described above, repeated measures analyses of variance (ANOVA) were performed where the between subject variable was past interest (yes or no, as assessed using the SIQ). Individual analyses were performed for each of these 11 stimuli: a life-like doll, a childish-looking doll, a sorting task, an envelope stamping task, a robotic animal, a plush animal, a real dog (with a handler), a respite video, a large print magazine, coloring with markers, and individualized music. As we wanted to compare responses to each of these 11 stimuli with responses to stimuli that did not reflect the category of past interest, other comparison stimuli were included. These included a squeeze ball, tetherball, an expanding sphere, an activity pillow, folding towels, flower arrangement, building blocks, a fabric book, a wallet or purse, and a puzzle, as well as other stimuli from the list of the 11 stimuli. Two way ANOVAs were conducted with a within group factor of the stimulus under study versus the mean of the comparison stimuli, and a between group factor of those who had a past interest related to the stimulus versus those who had not. The dependent variables were the different engagement measures: engagement duration, attention, and attitude. According to the hypothesis, a significant interaction term would indicate that those who had a past interest in the area represented by the stimulus showed more engagement with the stimulus compared to those without a past interest, whereas there would be no difference in engagement between groups to the interest-neutral comparison stimuli. All repeated measures ANOVA were performed a second time using present interest (yes or no, as assessed using the SIQ) as the between subject variable. All statistical analyses were performed using SPSS software.

Results

Significant differences in levels of engagement between groups with or without a reported past or present interest were seen for the categories of music, art, and pets.

Music

The results of the analysis pertaining to the impact of having a past interest in music on engagement to a music stimulus versus nonmusic stimuli are presented in Table 1. As can be seen, the main effect of music was significant such that engagement duration, attention, and attitude were higher for the non-music stimuli than they were for the music stimuli ($F_{(1,164)}=16.73$, $F_{(1,146)}=90.60$, $F_{(1,146)}=40.37$, $p\leq 0.001$, respectively). The test statistics for the interaction terms were also significant for engagement duration, attention, and attitude, thus supporting the hypothesis under study. Specifically, those who had a past interest in music (based on a relative's report) manifested greater engagement with music in comparison to residents who had no past interest in music, whereas engagement with the comparison stimuli was at a similar level for the two groups, ($F_{(1,164)}=6.11$, $F_{(1,146)}=6.11$, $F_{(1,146)}=5.58$, $p\leq 0.05$ for duration, attention, and attitude, respectively).

Another ANOVA was performed in order to examine the impact of a present interest (based on relative's reports) in music on the engagement response measures. As shown in Table 1, the main effect of music was significant for engagement duration, attention, and attitude ($F_{(1,164)}=6.11$, $p\leq 0.05$; $F_{(1,146)}=65.82$, $p\leq 0.001$; $F_{(1,146)}=24.82$, $p\leq 0.001$, respectively; see Table 1). Examination of the interaction term for engagement duration revealed that residents with a present interest in music had the longest engagement duration for the music stimulus (mean=147.37 s) and those without an interest in music had the shortest duration for the music stimulus (mean=51.94 s; $F_{(1,164)}=13.93$, $p\leq 0.001$), whereas responses to the comparison stimuli were similar regardless of preference for music. We also found the same relationship for the interaction terms for attention and attitude, both being statistically significant ($F_{(1,146)}=10.67$, $p\leq 0.001$; $F_{(1,146)}=6.97$, $p\leq 0.01$, respectively).

Art

The main effect of coloring was significant for engagement duration, with residents being engaged longer, on the average, with coloring rather than noncoloring stimuli ($F_{(1,160)}=15.65$, $p\leq 0.001$). The test statistics for the main effect of attention and attitude were not significant, indicating that coloring did not differ from other stimuli on these dimensions of engagement (Table 1). However, examination of the interaction term pertaining to present interest in art revealed significant results for all three measures of engagement; that is, the highest responsiveness to coloring was seen for those who were reported by their relatives to be artistically inclined in the present, but responsiveness for the comparison stimuli as well as to coloring by study participants who were not artistically inclined were all at a lower level ($F_{(1,160)}=14.70$, $p\leq 0.001$; $F_{(1,141)}=5.86$, $p\leq 0.05$; $F_{(1,141)}=6.77$, $p\leq 0.01$, for duration, attention, and attitude, respectively). Analyses pertaining to past interest in art were not statistically significant.

Pets

When we examined the interaction term between past interest in pets and engagement with the real dog *versus* comparison stimuli, we found that it was statistically significant for engagement duration. Study participants with a past interest in pets had a longer mean engagement duration with the real dog (150.12 s) than did residents without a past interest in pets (mean=73.16 s); moreover, this value of 73.16 s was considerably less than the mean for the comparison stimuli for the group of residents without a past interest (mean=128.72 s; $F_{(1,164)}=4.065$, $p< 0.05$).

Analysis revealed that study participants who were reported to currently enjoy dogs had significantly higher attention scores to the real dog (mean=2.80) relative to those residents without a present interest in pets (mean=2.30), whereas their attention to the comparison stimuli were more similar (means=2.40 and 2.24, respectively) ($F_{(1,129)}=4.70$, $p< 0.05$; see

Table 1). Analyses pertaining to duration and attitude to the real dog were not significant. Interaction terms pertaining to interest in robotic or stuffed animals, babies, office work, watching television, and reading were not significant.

Discussion

Although past preferences for music and pets were predictive of current responsiveness, information about current preferences was generally more potent. Informants were able to discern past *versus* present preferences. Present preferences sometimes take into account the effects of cognitive decline and general apathy as well as changes in interest that are related to changes in life stages, such as a decreased interest in work-related stimuli and a relative increase in interest towards family-related stimuli (Cohen-Mansfield et al., 2006b). These are therefore appropriately more predictive of present behaviors. Additionally, the results of the present study add to Gerdner's studies on individualization of treatment (Gerdner, 2000; Gerdner & Swanson, 1993). Whereas, Gerdner showed that individualizing the type of music to participants' past preferences increased responsiveness, this article demonstrates that taking into account current preferences is similarly effective.

We found that residents with current interests in music, art, and pets were more engaged by stimuli that reflect these interests than were those residents who did not share these interests. Previous studies have reported music (Koger, Chapin, & Brotons, 1999) and pet therapy (Churchill, Safaoui, McCabe, & Baun, 1999; Richeson, 2003) to be successful interventions in persons with dementia, but this study takes it one step further by demonstrating the importance of determining a person's preferences for stimuli in order to predict responsiveness.

Analyses pertaining to interest in babies, office work, watching television, and reading were not significant. The lack of significant results could be due to those persons with an interest in one of these stimuli having a strong interest in other stimuli as well.

Another issue that must be considered is the gap in adequate correspondence between the real-life activities associated with these interests and the stimuli actually presented. For example, we compared persons who had a reported interest in watching TV to those who did not by observing their reactions to a respite video. It would be more appropriate (but a more complicated process) to compare these groups on their reaction to a favorite TV show. Finally, it is of course possible that some interests and capabilities are lost (particularly in activities such as reading) with dementia and are no longer reflected in the older person's actual behavior.

Study limitations include the fact that a limited set of stimuli was examined, and these may not have been tailored closely enough to the individual. For example, reading may show a relationship with preference when it is tailored to the specific type of reading the person used to like. In addition, only interests in individually-based activities were considered in the present study, and future studies may also want to explore interests in group activities, such as playing games or singing in a choir.

From a theoretical point of view, interest in stimuli represents the interaction between person and stimulus, which make one person more amenable to be engaged with the stimulus than another, beyond the impact of general person variables, such as gender or level of cognitive function. The impact of those latter person variables on engagement is described elsewhere (Cohen-Mansfield, Marx, Regier, & Dakheel-Ali, 2009). The person-stimulus interaction itself can be construed as a continuum. A high level of such interaction is expected for stimuli that are based on a person's self identity, i.e., stimuli that reflect the most important roles the person has identified with, such as the most important professional

role, family role, leisure activity role, or attribute (e.g., participation in a specific event). So, if the most important role was the person's profession, providing stimuli that relate to that profession and revive, to some extent, the person's sense of role identity, has a potent impact (Cohen-Mansfield, Thein, Dakheel-Ali, & Marx, in press). The construct of preference is one of lower potency on the person–stimulus interaction continuum, where a person had an affinity for a stimulus, but it may or may not necessarily represent a pivotal role in their identity. Future research needs to examine the relationships between 'preferences' and 'role identities'. However, from a practical point of view, where nursing home staff are always overburdened and have limited knowledge of nursing home residents (Cohen-Mansfield et al., 2006b), the use of individualized, identity-based stimuli is very limited. An easier method for engaging a resident is using standard stimuli, which staff members could have at hand. This, however, raises the issue of whether person–stimulus interaction will play a role, i.e., whether knowledge of the person's preferences in the past or in the present is important when working with persons with advanced dementia (mean MMSE in this study was seven, far lower than most studies of persons with dementia). Our study provides an initial answer. Knowledge of preferences is important at least for some stimuli, and when the stimulus to be presented is sufficiently close to the stimulus available in the past.

Conclusions

Residents with current interests in music, art, and pets were more engaged by stimuli that reflect these interests than were those residents who did not share these interests. These findings demonstrate the utility of determining a person's preferences for stimuli in order to predict responsiveness. Lack of prediction for some stimuli may reflect differences between past preferences and activities that are feasible in the present, the possibility that preferences for certain stimuli are irrelevant in this population, or that these stimuli need modification. Future studies need to examine these alternatives, explore closer matching of current stimuli to the content and type of past preferences, and expand the scope of stimuli.

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Table 1

Engagement duration, attention, and attitude for setting characteristics.

Stimulus	Duration		Attention		Attitude	
	Music	Nonmusic	Music	Nonmusic	Music	Nonmusic
Music – Past preference						
Past preference for music	109.00	131.68	1.78	2.24	4.61	4.81
No past preference	45.50	136.08	1.50	2.30	4.39	4.83
<i>F</i> -value music	16.73***		90.60***		40.37***	
<i>F</i> -value interaction	6.11*		6.11*		5.85*	
Music – Present preference						
Stimulus						
Present preference for music	147.37	134.77	1.94	2.26	4.70	4.82
No Present preference	51.94	130.54	1.53	2.26	4.43	4.82
<i>F</i> -value music	6.11*		65.82***		24.82***	
<i>F</i> -value interaction	13.93***		10.67***		6.97**	
Art^d – Past preference						
Stimulus						
Past preference for art	178.93	154.28	2.19	2.29	4.83	4.87
No Past preference	144.38	126.16	2.19	2.19	4.74	4.79
<i>F</i> -value coloring	1.77		0.67		1.25	
<i>F</i> -value interaction	0.04		0.48		0.04	
Art^d – Present preference						
Stimulus						
Present preference for art	331.93	143.88	2.78	2.39	5.15	4.91
No present preference	136.29	133.34	2.12	2.20	4.72	4.81
<i>F</i> -value coloring	15.65***		2.38		1.53	
<i>F</i> -value interaction	14.70***		5.86*		6.77**	

Stimulus	Coloring	Other	Coloring	Other	Coloring	Other
Pets – Past preference						
Stimulus	Pets	Other	Pets	Other	Pets	Other
Past preference for pets	150.12	145.00	2.60	2.32	5.35	4.84
No past preference	73.16	128.72	2.29	2.26	5.12	4.82
<i>F</i> -value pets	2.81		4.11*		30.83***	
<i>F</i> -value interaction	4.07*		2.66		2.08	
Pets – Present preference						
Stimulus	Pets	Other	Pets	Other	Pets	Other
Present preference for pets	180.77	170.46	2.80	2.40	5.51	4.91
No present preference	84.83	123.47	2.30	2.24	5.12	4.79
<i>F</i> -value pets	0.72		8.15**		36.57***	
<i>F</i> -value interaction	2.15		4.70*		3.24	

Notes: Comparison stimuli for the music, art, and pet categories included: a life-like doll, a childish-looking doll, a sorting task, an envelope stamping task, a large print magazine, a squeeze ball, a tetherball, an expanding sphere, an activity pillow, towels to fold, a flower arrangement, building blocks, a fabric book, a wallet or purse, and a puzzle. In addition, each of the comparison stimuli groups for each of the stimulus categories (art, music, pets) contained items from the other two stimulus categories.

^a Art stimuli included coloring with markers.

^b Pet stimulus included a real dog.

*** $p \leq 0.001$,

** $p \leq 0.01$,

* $p \leq 0.05$, respectively.