

Guiding the Game: A Model for How Facilitation, Psychological Safety, Cohesion, and Creativity are Interrelated in *Dungeons & Dragons* Groups

Abstract: Tabletop role-playing games (TTRPGs) are used in many applications ranging from community building to education to therapy. There is a persisting need to continue expanding our understanding of how practical successes and beliefs about the value of tabletop RPGs function as facilitators of benefits, like creativity, which are assumed to be inherent in tabletop RPG experiences. This exploratory survey research adds quantitative data analysis to help understand relationships between facilitation, psychological safety, group cohesion, and creativity in tabletop role-playing games by asking: what relationships exist between the variables in players' reported experiences of playing *Dungeons & Dragons* 5th edition (*D&D* 5e)? An internet survey of multi-item scales collected over 400 responses from participants who reported playing *D&D* 5e. Confirmatory factor analysis, principal components analysis, and regression analyses were conducted. This provided the following factors as valid constructs: facilitation, clarity, cohesion, support, and creativity. Regressions were analyzed among the factors, revealing these elements interrelated and indirectly related aspects in tabletop RPG experiences. We introduce a multi-item scale to measure facilitation in tabletop RPGs and outline a model for how facilitation is interrelated with clarity, cohesion, and support on one end, and creativity is interrelated with clarity, cohesion, and support on the other.

Keywords: psychological safety, role-playing games, facilitation, creativity, group cohesion

Joe Lasley

University of Southern Maine, USA
joe.lasley@maine.edu

Antonio Ruiz Ezquerro

Florida State University, USA
arezquerro@gmail.com

1. BACKGROUND

What's the deal with the use of a formerly shunned leisure activity recently made popular for personal growth? Back in the day, *Dungeons & Dragons* (*D&D*) was regarded as a dangerous thing from which most parents had to protect kids due to a moral panic, with the typical stereotype being that participants played in basements. Compare that to today, when organizations like Game to Grow, Geek Therapeutics, and countless popular media entities applaud the benefits of playing the modern edition of the same game. In this paper, we report some research findings about interesting aspects of how leisure *D&D* players reported experiencing key elements of gameplay that are relevant to other applications. Games are widely used for both game-based learning and as inspiration for gamification: the application of game design elements in non-game contexts like business or education (Karagiorgas and Niemann 2017). Game-based learning, in particular, has been used to enhance learning in higher education and still requires further investigation (Crocco, Offenholley, and Hernandez 2016). tabletop RPGs specifically are unique phenomena that serve as a meaningful subject of focus within the topics of game studies and designing experiential learning that utilizes a game designed originally for leisure.

TTRPGs are used in many applications ranging from community building to education to therapy just to name a few (Bean, Daniel and Hays 2020; Bowman 2010; Randi and Carvalho 2013). Therapeutically applied tabletop RPGs have recently been reported to include benefits such as social connection with peers and engagement with creativity (Kilmer, Rubin, Scanlon, and Kilmer 2024). The rise in popularity of *D&D* along with the establishment of applied tabletop RPG groups like Game to Grow has helped spread awareness and practical uses of tabletop RPGs for facilitating intentional outcomes like personal growth, learning, or creativity. The Transformative Play Initiative is dedicated to research, development, and education about how RPGs can transform or otherwise impact people in profound ways. Much of the popular claims about the benefits of tabletop RPGs involve a belief that they foster inherent qualities valuable for learning, like psychological safety or creativity. These assumptions lend practitioners and enthusiasts to transfer facilitation practices of leisure tabletop RPG play into intervention strategies or teaching methods (Bean, Daniel and Hays 2020; Garcia 2016). Learning, in many forms, may be an important mechanism for gaining benefits from games.

1.1 Learning in Role-Playing Games

Hammer et al. (2018) argue that RPGs, regardless of their presentation, are capable of promoting learning in ways that align with four foundational learning theories: behaviorism, cognitivism, constructivism, and the sociocultural approach. We will briefly explain the latter two. Constructivist theory argues that learning is the result of learners *constructing* knowledge after making meaning of new beliefs, experiences, and attitudes, and connecting the new information to previously held ideas, changing them in the process (Wadsworth 2004). In contrast, the sociocultural approach argues that learning requires social interactions. This interaction does not necessarily happen in person, it may occur through observation, replication, experimentation, or when internalizing feedback (Bandura 1986). Further, Bowman and Hugaas (2019) and Daniau (2016) argue that RPGs can be catalysts of *transformational experiences*, meaning that the role-play can have such an impact on the player that they adopt certain aspects of the experience into their identity or life, e.g., obtaining a higher degree of self-confidence when approaching strangers as a result of multiple role-played conversations with fictitious characters. Using the theories mentioned, one can explain learning in RPGs as a result of interacting in a space where experiential learning (constructivism) is constantly happening, and meaning-making is further supported by the created social environment (sociocultural approach) between players and their interactions (Hammer et al. 2018). In addition to learning, role-playing is another potential mechanism for the benefits of tabletop RPGs.

Role-playing is thought to be a tool for using, revealing, and developing several human skills, including creativity, in some intentional game designs (Daniau 2016). The transformative potential of tabletop RPGs is associated with various learning strategies such as design, debriefing, and critical reflection (Bowman and Hugaas 2019). Logistical elements such as play style, length of sessions, and frequency of sessions may all play a role in how or to what extent groups experience cohesion or psychological safety. Perhaps preferences for role-playing or tactical combat also play a role in what outcomes are developed by players.

Westborg (2023) created the Role-playing Game Design Matrix to classify RPG designs by separating them based on whether they pursue leisure or educational motives in their gameplay, with framing designs based on the types of learning desired. Westborg (2023) describes gameplay as the elements that have an effect on a player's in-game options, e.g., the plot, available actions to take, and the built world, among other elements. In contrast, Westborg describes framing as everything that occurs around the game to enhance the game experience. Framing may take the shape of a pre-game session, or a post-game debrief, among other forms. Her proposed model argues that given the proper framing, learning can be promoted in role-playing games, even those that were originally designed for leisure reasons. Creating a safe learning environment

comes into focus given that learning theories are promising for exploring the mechanisms of experiencing benefits with tabletop RPGs.

1.2 Leadership Learning in Larp

Some research on leadership and live action role-playing (larp) contributes to understanding leadership learning in role-playing games generally when approaching tabletop RPGs by highlighting the importance of experiential learning. Management techniques in RPG contexts show how structured facilitation can maintain engagement and support the experiential goals of the game, reflecting the cultural and social dynamics essential for crafting inclusive and relevant learning experiences (Harviainen 2013). Furthermore, Matyas and van Bilsen (2024) discussed practical applications and theoretical foundations necessary for utilizing RPGs to foster significant educational outcomes, particularly in developing leadership and team dynamics within a learning environment. Larps sometimes have an innate ability to simulate complex social settings that are rich in learning opportunities involving group dynamics (Balzac 2016). Participants in larps and other analog RPGs can experiment with various leadership styles and navigate group dynamics in real-time, which mirrors and potentially impacts their behaviors in non-game contexts. This dynamic setting requires a deeper exploration of the group dynamics and leadership interactions that shape the unique social environment of role-playing games. By focusing on *Dungeons & Dragons*, due to its popularity and colloquial connection with these hypotheses, this research adds to the stage for a broadening understanding of how specific role-playing environments can enhance and illuminate the complex interplay of leadership and group dynamics such as creativity, psychological safety, cohesion, and facilitation.

1.3 Creativity and psychological safety

Creativity in tabletop RPGs is potentially associated with psychological safety in addition to game design. Games are believed to provide engagement (Plass et al. 2015) and psychological safety (Bowman and Lieberoth 2018), aka alibi, that enhances the potential for learning and creativity. Psychological safety in this study is defined as emotional feelings of support, trust, and safety in a group gaming setting. The analysis showed two factors of psychological safety, which were named clarity and support. Hao, Yang, and Liu (2017) reported a link to creativity at work having observed that psychological safety had a crucial role in promoting employee creativity. Group psychological environments while playing tabletop RPGs have likewise been reported to generate both creativity and feelings of safety (Lasley 2022). RPG players have been reported to test higher in creativity than other participants (Chung 2013). Further, groups have reported powerful experiences involving collective creativity generated through the process of forming fantasy narratives together (Cover 2010). Fantasy role-playing games are spaces in which players exercise creativity alongside enacting important cultural markers and storytelling (Cragoe 2016). Creativity accompanies maintaining friendships (cohesion) among the reasons for playing *Dungeons & Dragons* (Wilson 2007). Questions about facilitation and cohesion become relevant when considering combining the links between creativity and psychological safety with intentions to leverage intentional learning in leisure activities.

1.4 Facilitation and Cohesion

In *D&D* specifically, a Dungeon Master (DM) is a referee and narrator charged with coordinating the challenges and details of a given adventure. This role is commonly referred to as a Game Master (GM) more broadly in the tabletop RPG context and is often implicitly responsible for managing the group as well as the game. For this paper, we use the terms somewhat interchangeably; using DM for *D&D* specific uses related

to the particular sample in this research and GM to refer to this role in any tabletop RPG (including DMs). Facilitation, usually by the GM, is thought to be highly important for impacting player and group experiences (Lasley 2020; Toles-Patkin 1986). Players often look to game facilitators to perform group functions such as resolving social conflicts (Bowman 2013). The GMs who facilitate these games use facilitation skills (balancing attention, resolving conflict, giving direction, prompting) that are useful in other areas of life (Bowman 2010; Daniau 2016; Garcia 2016). On the flip side, therapeutic interventions have been adapted and deployed through facilitated tabletop RPG play (Bean Daniels and Hays 2020). In either sense, the facilitation provided by the GM constitutes aspects of the game experience that may influence the cohesion of a group or the sense of safety for players.

Group dynamics, like cohesion and leader relationships, also link facilitation to players' experience of the gaming environment, influencing individual experiences of psychological safety and creativity (Lasley 2020; Yi et al. 2017). Other group functions, such as support from members and playful, inclusive normed behavior, add cohesion to the gaming environment through member interactions (Lasley 2020). The inter-related nature of facilitation, psychological safety (clarity and support), cohesion, and creativity is important in many applied contexts, making their existence in leisure tabletop RPG play of interest to practitioners in a variety of disciplines.

1.5 Opportunity for research

More quantitative data should be analyzed regarding psychological safety in tabletop RPG groups, with a specific focus on facilitation, group cohesion, and creativity. Claims about using tabletop RPGs as vehicles for experiential learning rest on the presumption that the games themselves generate psychological safety or creativity. Therefore, it is important to see if or to what extent facilitation and psychological safety exist, or may be interrelated, in these games in their leisure forms to inform the application and facilitation of tabletop RPGs in therapeutic, educational, and training settings.

There is a persisting need to continue expanding our understanding of how practical successes and beliefs about the value of tabletop RPGs function as a vehicle for benefits like creativity that are assumed to be somehow inherent in tabletop RPGs as an experience or interaction system. This opens up preliminary questions about what forms of facilitation occur in tabletop RPG experiences and how they may be linked to group cohesion, psychological safety, and creativity. It will be helpful to better understand the inherent forms of facilitation and assumed benefits of tabletop RPG experiences, especially when importing them into other contexts.

This study began with an aim to explore relationships between game design elements and group creativity in tabletop RPGs, specifically *Dungeons & Dragons* 5th Edition (*D&D* 5e), and resulted in a reclassification of factors within the original concepts of group creativity and psychological safety in addition to the creation of the Facilitation scale. *D&D* 5e was chosen due to its popularity, intentionally customizable design, the researcher's familiarity with the game, access to participants, and an effort to focus the scope of the study in a meaningful way.

The study began with using multi-item scales to measure DM facilitation, group creativity, and psychological safety in *Dungeons & Dragons* 5e games. Factor analyses refined the original variables into facilitation; clarity and support (factors of psychological safety); and cohesion and creativity (factors of group creativity). Psychological safety was a previously researched construct using a modified version of an established multi-item scale. Group creativity was originally defined for this study as the use of the imagination or original ideas to transfer concepts from a person or group's internal reality into a shared external reality using an existing creativity scale with added group items. The analysis showed these survey items to comprise two factors later renamed as cohesion (being in a group) and creativity (making ideas real). Thus, this paper

is about the newest iteration of variables and their component factors: facilitation, clarity, cohesion, support, and creativity.

1.6 Research Purpose

The purpose of this research was to investigate the assumed associations among facilitation, psychological safety, group cohesion, and creativity in *D&D* games. In addition to gaining an understanding of tabletop RPGs, this study aimed to identify what constitutes the variables in this study as reported by this sample. We began with existing, sometimes modified, scales for creativity and psychological safety alongside original items for group cohesion and an original scale for DM facilitation. Given the popular combination of facilitating games with other intents such as teaching and therapy, we refined the construct of DM facilitation and analyzed how facilitation is interrelated with psychological safety, cohesion, and creativity. These findings show how facilitation, cohesion, safety, and creativity were constructed by *D&D* players, as reported by participants.

1.7 Research Questions

The primary research question: “What relationships exist between facilitation, group creativity, and psychological safety in Tabletop Role-Playing Games?” developed into the re-organization and definition of constructs. We were curious about how the responses from these participants aligned and compared with the existing constructs. What principle components and underlying associations are reported by *D&D* players among existing constructs of psychological safety, creativity, and group cohesion?

Further investigation explored aspects of facilitating tabletop RPG experiences. This new construct is composed of items tied to the Dungeon Master (DM) including reward allocation, flexibility with rules, plot linearity, balancing attention among players, and DM role-playing (identified through qualitative content analysis of DM facilitating strategies). This resulted in the creation of a new multi-item scale measuring the facilitation by a DM. This part of the research asked: How is facilitation reported by *D&D* players and what links exist to the other variables in this study sample?

2. METHOD

In the exploration of gameplay elements and psychological constructs within tabletop role-playing games, particularly *Dungeons and Dragons* 5th Edition (*D&D* 5e), this study employed a virtual survey to gather data from an engaged community of players. Utilizing an internet-based questionnaire distributed across various online platforms dedicated to *D&D* 5e enthusiasts—such as Reddit, Facebook groups, and Twitter—the research successfully collected over 400 completed responses to form a convenience sample. This method secured approval from the University Institutional Review Board and adhered to informed consent principles. The dataset, comprising 415 participants, provided a robust sample for examining facilitation, cohesion, clarity, support, and creativity.

2.1 Sample

A virtual survey form was distributed in online *D&D* 5e groups on sites including Reddit, soliciting over 400 completed responses from self-reported players of *D&D* 5e. There are a few descriptive statistics that illustrate the participants’ experience with their latest *D&D* 5e campaign (see Table 1).

Table 1: Sample's tabletop RPG Gaming Experience (N=415)

Category	Detail	Percentage	Participants
Number of Meetings	Only once	12	50
	Two to five times	26.3	109
	Six to ten times	21	87
	More than ten times	40.7	169
Duration of Game Sessions	Two hours or less	5.8	24
	More than two but less than five hours	77.3	321
	More than five but less than eight hours	14.7	61
	More than eight hours	2.2	9
Frequency of Meetings	Once a year	7.7	32
	Less than once per month	10.8	45
	About once per month	14.2	59
	More than once per month but less than once per week	38.8	161
	Weekly or more often	28.4	118
Role Experience	Played Dungeon Master role	78.8	327
	Not played Dungeon Master role	21.2	88
	Played Player role	99.5	413
	Not played Player role	0.5	2

When asked about the number of meetings they have had, 12% reported only having played once, 26.3% indicated having played between two and five times, 21% had met six to ten times, and 40.7% had met more than ten times. Participants were more consolidated regarding the duration of their game sessions. 5.8% indicated playing for two hours or less, 77.3% reported playing more than two but less than five hours per session, 14.7% shared playing more than five but less than eight hours a session, and only 2.2% played longer than eight hours in a session. Regarding the frequency of their meetings, 7.7% reported meeting once a year, 10.8% mentioned playing less than once per month, 14.2% said they played about once per month, 38.8%

claimed meeting more than once per month but less than once per week, and 28.4% shared playing weekly or more often. Additionally, out of the 415 participants, 78.8% claimed to have played a Dungeon Master role at some point in their lives, and the remaining 21.2% had not. In contrast, 99.5% claimed to have taken a player role in the past, and only 0.5% had not.

2.2 Instruments

The survey instrument consisted of 46 items in total. These included screening questions, general logistics questions with categorical response options, and a Likert matrix for the multi-item scales. The screening questions were simple, asking if the participant was 18 years of age and had played *D&D*. The majority of the survey items (all multi-item scales for facilitation, psychological safety, cohesion, and creativity) utilized a matrix of statements and a 7-point Likert-type scale ranging from strongly disagree to strongly agree.

Three main multi-item scales were included in the survey in addition to descriptive information. The scales measured facilitation, psychological safety, cohesion, and creativity with additional questions about the group and game logistics. DM facilitation items were added to a new scale after a qualitative content analysis of GM Tips for tabletop RPGs (Mercer 2016). The new facilitation items were used as a measure of the DM's influence on the players' experience of the game through their facilitation of the game. Psychological safety items were modified and combined from several existing scales (Edmondson 1999; May, Gilson and Harter, 2004; Simonet, Narayan and Nelson 2015). Group cohesion items were added to the creativity scale. A creativity scale was composed of existing scales (Lang and Lee 2010; Li, Fu, Sun and Yang 2016) and modified for the context of this study by changing the wording to be about playing a tabletop RPG. Modifications for psychological safety and creativity scales consisted of rewording items so that they made sense in the context of playing a tabletop RPG, as opposed to working or playing hockey, while preserving the original meaning of the item.

2.3 Research Protocol

This study utilized an internet survey to collect a convenience sample of over 400 *D&D* 5e players. Since there is no dependable list of tabletop RPG players from which to create a sample frame and this study is primarily concerned with relationships between variables as opposed to generalizing population parameters, a convenience sample is the optimal form of data collection. The limitations of convenience sampling are acceptable for this study given its exploratory nature.

The survey was constructed using Qualtrics software and distributed via the internet using popular fan sites and social networks for *D&D*. These included *D&D* player Facebook groups, subreddits, Twitter hashtags, etc. Some popular social media accounts assisted with sharing an invitation to participate with exposure to thousands of users. The internet community of *D&D* players is known for its high level of engagement, which was leveraged to help generate a large sample size. The target sample was people who have played *D&D* 5e as a player. The following message was used for solicitation:

I am studying creativity in *Dungeons & Dragons*. I am a fan, player, DM, and researcher working on a PhD [degree and institution redacted]. If you have played *D&D* 5e please take 7 minutes to complete this survey and share it with your friends.
Have Fun!

All data was downloaded and converted to .sav, .Rda, and .xls for further analysis with SPSS, R Studio, and Excel respectively. Each participant and their answers were treated as an individual case. Because the sur-

vey used a Likert scale to record responses, all participant answers were given a score from one to seven, with one representing “strongly disagree” and seven meaning “strongly agree.” Only one question in the survey used a reverse score (“Players fear being judged negatively by other players “). Questions were then split into the three categories they represented: Dungeon Master skills, psychological safety, and group creativity. Each participant’s response received a score on each of the three categories based on the sum of their answers. This method made it possible to analyze and compare the samples’ answers to each question as well as the category.

2.4 Statistical Analysis

To address concerns regarding the validity of the modified surveys, we used R Studio to conduct a confirmatory factor analysis (CFA) that considered all 32 items from the multi-item scales split into their original scales. The results showed an NNFI (Tucker-Lewis Index) = .808, CFI = .821, and RMSEA = .073. We wondered whether some of the items across the surveys could be considered somewhat repetitive, and thus, elevated the scores of each scale. To address this issue, we conducted a principal component analysis (PCA) for each scale using SPSS Statistics 26. One of the advantages of conducting a PCA is that it allows for specific items on various scales to cluster together into a new and unique category. Knowing there may be a correlation between the observed factors, we ran the PCAs with Promax rotation and Kaiser normalization to shift the scale mean as the average score (Kaiser 1958). We proceeded to run a series of multivariate regression analyses to better understand the relationships between all confirmed factors.

3. RESULTS

The analyses conducted in this study resulted in confirming the facilitation factor items in the DM scale and reorganizing the multi-item scales into new factors. This provided the following factors as valid constructs that came out of the original constructs for the DM, psychological safety, group cohesion, and creativity.. The confirmed factors were facilitation, clarity, cohesion, support, and creativity. Regressions were analyzed among the new factors, revealing the interrelated and indirectly related aspects of these elements in participants’ tabletop RPG experiences.

3.1 Factors

The original Dungeon Master scale, which consisted of seven items, remained at seven items. However, it was split into a two-factor solution. We named factor 1 facilitation and factor 2 objects (see Table 2). The combined factors explained 45% of the variance among the PAR-balanced sub-sample (see Appendix 1 to compare the percentage of variance of each factor).

The original Psychological Safety scale consisted of 12 items. It was split into an 11-item two-factor solution with factor 1, which we named support, and factor 2, which we named clarity (see Table 3). Clarity and support were named the two sub-factors of psychological safety due to the factor loadings. The original scale was an established measure for psychological safety as a single variable. The results in this dataset loaded into two sub-factors within the psychological safety variable and we chose names that were fitting based on the survey items in each sub-factor loading. The combined factors explained 51% of the variance among the PAR-balanced sub-sample (see Appendix 2 to compare the percentage of the variance of each factor).

Table 2: Factor Loadings and Communalities for Varimax Rotated Two-Factor Solution for 7 DM Items: Facilitation and Objects (N=412)

	1: Facilitation	2: Objects	Communality
1. Player rewards are provided appropriately	0.67	-0.11	0.49
2. The Dungeon Master is able to effectively debate rules	0.82	-0.17	0.68
3. The Dungeon Master is open to feedback	0.81	0.18	0.69
4. The Dungeon Master commits to role-playing the non-player characters	0.64	-0.14	0.43
5. Attention is balanced among all the players	0.61	0.11	0.38
6. The plot of our story is linear	-0.04	0.75	0.56
7. We rely on detailed maps	0.00	0.74	0.55

Note: Survey items in the white box fall under factor 1: Facilitation. Survey items 6 and 7 fall under factor 2: Objects. No survey items were dropped by the PCA's results.

Table 3: Factor Loadings and Communalities for Promax Rotated Two-Factor Solution for Support and Clarity for 12 PS Items (N=404)

	1: Support	2: Clarity	Communality
1. Players share openly	0.50	0.28	0.49
2. Players (not necessarily the characters) are honest	0.68	-0.05	0.43
3. Players are permitted to contribute ideas	0.55	0.07	0.35
4. Players are able to effectively debate	0.62	0.12	0.48
5. It is okay to make mistakes	0.68	0.06	0.51
6. Players are supportive	0.77	0.08	0.67
7. Players are open to feedback	0.65	0.17	0.58
8. The goals each player has for playing are clear	-0.10	0.80	0.56
9. Everyone shares a common understanding about what kind of experience we want when playing together	0.19	0.64	0.59

10. The goals of the challenges that characters face are clear	-0.22	0.86	0.56
11. Players take responsibility for their role in the group	0.25	0.55	0.53
12. Players do not fear being judged negatively by other players	0.80	-0.40	0.42

Note: Survey items in the white box fall under factor 1: Support. Survey items 8-11 fall under factor 2: Clarity. Survey item 12 was dropped by the PCA's results.

Table 4: Factor Loadings and Communalities for Promax Rotated Two-Factor Solution for Cohesion and Creativity for 13 GC Items (N=409)

	1:Cohesion	2: Creativity	Communality
1. Each person makes unique contributions to our experience	0.64	0.14	0.53
2. People in the group “get into” role-playing characters	0.55	0.19	0.46
3. There is a sense that we have created something together	0.78	0.05	0.65
4. We are all “in it together”	0.93	-0.14	0.73
5. There is a sense of continuing development in the group	0.89	-0.05	0.75
6. Our group has a sense of community	0.88	-0.17	0.63
7. The group comes up with new ideas	0.19	0.67	0.63
8. The group easily adapts new ways of playing	0.07	0.70	0.55
9. This group comes up with new tactics for solving problems	0.05	0.72	0.57
10. The group experiments with new concepts	0.11	0.76	0.69
11. The group generates original stories	0.40	0.39	0.49
12. The group explores new knowledge	0.44	-0.68	0.32
13. The group easily customizes new mechanics for our game	0.32	0.39	0.39

Note: Survey items in the white box fall under factor 1: Cohesion. Survey items 7-9 under factor 2: Creativity. Survey items 10-13 were dropped by the PCA's results.

Lastly, the original Group Creativity scale consisted of 13 items and was split into a 10-item two-factor solution with factor 1, which we named cohesion, and factor 2, which we named creativity (see Table 4). The combined factors explained 57% of the variance among the PAR-balanced sub-sample (see Appendix 3 to compare the percentage of the variance of each factor).

We then ran a second CFA to compare the validity of the new scales compared to those of the original. The CFA considered the 28 survey items split into their modified factor scales. The results showed an NNFI (Tucker-Lewis Index) = .883, CFI = .896, and RMSEA = .062, indicating it was a better model than the original. However, it resulted in the deletion of the “objects” factor as it did not have enough validity to justify inclusion.

3.2 Regression

Using the modified scale factors, we proceeded to run a series of multivariate regression analyses to better understand the relationship between all confirmed factors (facilitation, clarity, cohesion, support, and creativity). Each of the five regressions treated one of the new factors as a dependent variable and the rest as independent variables (see Table 5).

Table 5: Regression Coefficient Values for Each Model

Dependent Variable	Independent Variables						Model's Results			
	Facilitation	Clarity	Cohesion	Support	Creativity	Constant	Adj. R ²	df	F	Sig.
Facilitation		0.271***	0.178***	0.176***	0.06	8.481***	0.427	4(393)=397	74.978	<.001
Clarity	0.171***		0.144***	0.203***	0.091*	0.624	0.501	4(393)=397	100.83	<.001
Cohesion	0.234***	0.301***		0.474***	0.325***	-5.106***	0.634	4(393)=397	172.728	<.001
Support	0.181***	0.329***	0.369***		0.147**	13.086***	0.61	4(393)=397	155.938	<.001
Creativity	0.057	0.138*	0.235***	0.137**		3.165*	0.393	4(393)=397	65.365	<.001

3.3 Facilitation

When treating facilitation as the dependent variable, the regression explained 42.7% of the variance ($F(4, 393) = 74.98$, $p < .001$, $R^2 = .433$, $R^2_{\text{Adjusted}} = .427$). The results showed that cohesion ($\beta = .178$, $p < .001$), clarity ($\beta = .271$, $p < .001$), and support ($\beta = .176$, $p < .001$), were significant predictors of creativity. Creativity was not a significant predictor of facilitation.

3.4 Clarity

When treating clarity as the dependent variable, the regression explained 50.1% of the variance ($F(4, 393) = 100.83$, $p < .001$, $R^2 = .506$, $R^2_{\text{Adjusted}} = .501$). The results showed that creativity ($\beta = .091$, $p = .026$), support ($\beta = .203$, $p < .001$), facilitation ($\beta = .171$, $p < .001$), and cohesion ($\beta = .144$, $p < .001$), significantly predicted clarity.

3.5 Cohesion

When treating cohesion as the dependent variable, the regression explained 63.4% of the variance ($F(4, 393) = 172.73$, $p < .001$, $R^2 = .637$, $R^2_{\text{Adjusted}} = .634$). The results showed that creativity ($\beta = .325$, $p < .001$), support ($\beta = .474$, $p < .001$), clarity ($\beta = .301$, $p < .001$), and facilitation ($\beta = .234$, $p < .001$), were all significant predictors of cohesion.

3.6 Support

When treating support as the dependent variable, the regression explained 61% of the variance ($F(4, 393) = 155.94, p < .001, R^2 = .613, R^2_{\text{Adjusted}} = .610$). The results showed that facilitation ($\beta = .181, p < .001$), cohesion ($\beta = .369, p < .001$), clarity ($\beta = .329, p < .001$), and creativity ($\beta = .147, p < .005$), were all significant predictors of support.

3.7 Creativity

Using creativity as the dependent variable, the regression explained 39.43% of the variance ($F(4, 393) = 65.36, p < .001, R^2 = .400, R^2_{\text{Adjusted}} = .393$). The results showed that support ($\beta = .137, p < .005$), cohesion ($\beta = .235, p < .001$), and clarity ($\beta = .138, p < .026$), were significant predictors of creativity. Facilitation was not a significant predictor of creativity.

4. DISCUSSION

This study investigated the constructs and assumed associations among facilitation, psychological safety, group cohesion, and creativity in *D&D* games. Before conducting a regression analysis that demonstrated the interrelatedness of the variables, the components of existing constructs were confirmed. Mainly, we report on quantitative data analysis of the variables to begin understanding the interrelated psychological constructs of tabletop RPG groups, as reported by this sample of *D&D* players. Of particular interest is the finding that facilitation and creativity were not directly linked with each other but were both linked with the other variables (clarity, cohesion, and support) which were all interrelated, presenting nuances for understanding how tabletop RPG group dynamics are facilitated. Further, we introduce a multi-item scale measuring facilitation in tabletop RPGs specifically related to the role of the GM that can inform the combination of game master facilitation items with professional facilitation skills used in educational pedagogies and therapeutic interventions in attempts to foster clarity, cohesion, and support in applied tabletop RPGs. These findings will be helpful for practitioners who apply tabletop RPGs in contexts with intended outcomes or to further study such applications.

The pre-existing scales for established psychological constructs in this study included psychological safety and creativity. Items for group cohesion were added and a multi-item scale for DM facilitation was refined, consisting of items identified in a previous qualitative analysis of DM strategies and advice. Psychological safety is of unique interest in this sample as it resulted in two factors revealed through the analysis.

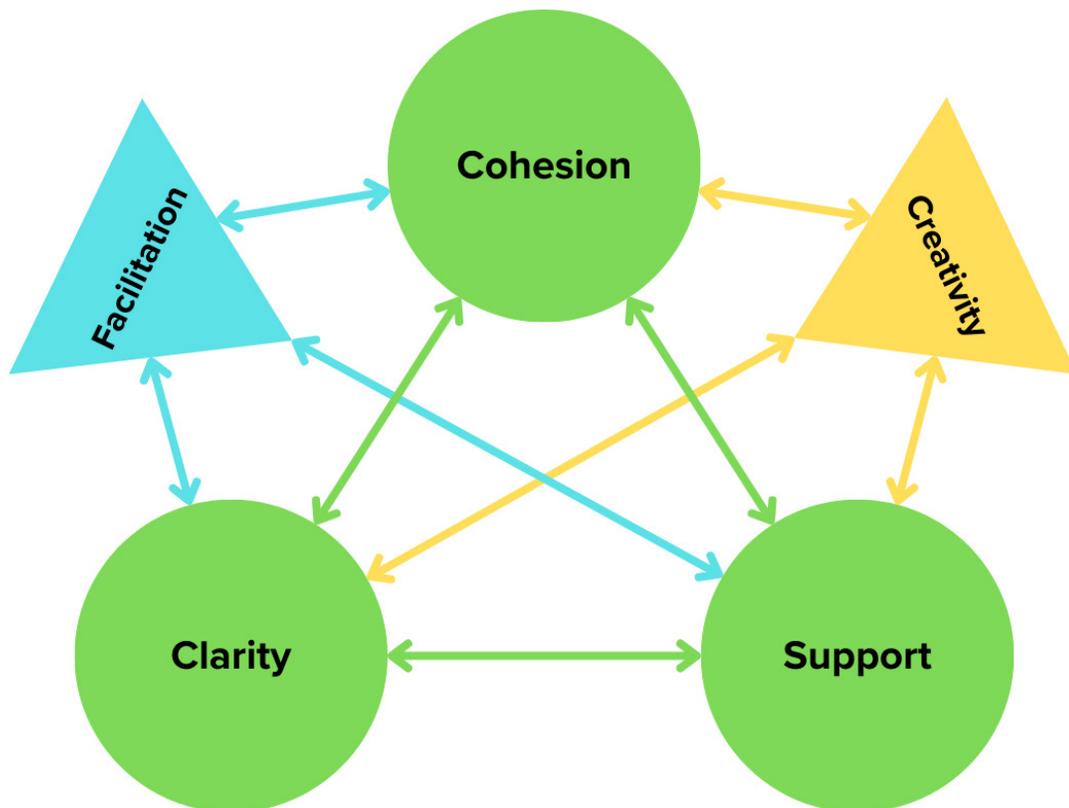
4.1 Psychological Safety

While previous research about psychological safety has highlighted its importance for teams and learning, the construct consisted of two factors (clarity and support) in this analysis. This is encouraging, supporting the idea that psychological safety is indeed present and important to creativity in tabletop RPG experiences. The identification of two factors prompts further insight. Clarity and support help to define sources and elements of psychological safety. The clarity items make sense from a leadership perspective, given that orientation and direction are key functions of authority and aspects of group dynamics (Tuckman 1965). The specific items for the clarity factor relate to group functions that are provided by a facilitator and underpinned by members of the group. The specific items for the support factor are primarily about the group members fulfilling supportive functions in group dynamics. These findings suggest that facilitators as well as group members can impact psychological safety in the group through varying functions of group dynamics. These group dynamics begin forming the nexus of interrelated constructs shown through our analysis.

4.2 The Nexus Network Model

The variables in this study formed a network of interrelated constructs. Each component, or node, is based on the refined factor loadings which were renamed based on the wording of specific items in the scale. Facilitation encompasses the items describing how the DM interacted in their role guiding the players during the game including fairness, openness, attention, and role-playing. Clarity is based on knowing what to do and being on the same page with other players. Cohesion included feelings of playing together and a sense of community. Support involved typical psychological safety items related to interactions between group members like honesty, non-judgment, supportiveness, and contributing ideas. Creativity was composed of established items about coming up with new ideas, approaches, solutions, and adapting. With one exception, all the variables in this study are interrelated with each other and mutually influence one another. The exception, which is quite notable, is the lack of a direct link between facilitation and creativity. There is a trio of interrelated group dynamics variables (clarity, cohesion, support) in the middle forming a nexus between and interrelated with both facilitation and creativity respectively. The data and analysis conducted in this study support the organization of these refined factors into a network framework in which facilitation is interrelated with clarity, support, and cohesion on one end, and creativity is interrelated with clarity, support, and cohesion on the other end (see Figure 1).

Figure 1: The Nexus Network Model of tabletop RPG Group Dynamics



Note: Green circles represent the trio of group dynamics and interactions, the blue triangle represents the DM's facilitation, and the yellow triangle represents creativity.

Some aspects of the group environment are influenced by the facilitation while others are influenced

by group dynamics and relationships among group members. This framework is congruent with the mediating role of psychological safety between leadership and creativity observed in work groups (Yi et al. 2017) and supports the basic idea that tabletop RPGs are human groups and they share fundamental functions with the way humans interact in other groups. Not surprisingly, gaming groups are similar to other groups in that there is a facilitating role of authority that manifests as a function of a group interrelated with other functions such as the needs for orientation, group cohesion, and support among members (Tuckman 1965).

It remains important to continue differentiating between work groups and gaming groups because the gaming environment involves play and fantasy in unique ways. While gaming environments are group environments, the mental frames involved in playing the game form a unique psychological context (Lasley 2022; Vorobyeva 2015).

This model begins articulating how common group functions manifest and are interrelated in gaming environments. For example, this model is congruent with the previous research reporting that leadership and creativity in a gaming environment both depend on the use of authority by a game master and are also fostered in the group dynamics generated through playing a tabletop RPG (Lasley 2020). It is important to note that specific behaviors for facilitation, clarity, cohesion, and support may look different in different groups and contexts. This model is a starting point for inquiring and trying to understand how these group functions manifest in tabletop RPG interactions.

4.3 Facilitation

A preliminary scale for measuring the facilitating role of a game master in tabletop RPGs is presented along with the distribution of psychological safety into group function categories of clarity and support, adding nuance to how psychological safety can be understood in tabletop RPG environments. The interrelated nexus model presents an important clarification for applied RPG practitioners and may contradict some assumptions or desires to be able to intentionally generate creativity mainly through design and facilitation. One implication is that design and facilitation efforts should focus on serving the clarity, cohesion, and support functions of a group to make space for the group to generate opportunities for creativity. This will complicate the intended outcomes desired in some contexts that depend on producing certain results because major factors, such as group cohesion, that are not solely controlled by the facilitator, will influence the dynamics among the players and potential outcomes, like creativity. On the other hand, processes such as group leadership coaching that intentionally rely on group dynamics to implement leadership development practices may be able to integrate design and facilitation strategies with group processes that are simultaneously tabletop RPG and group coaching practices. This type of applied strategy adds complexity and nuance to the facilitator's role and the players' experiences, warranting continued exploration of the integration of tabletop RPG with professional practices (ie, education or therapy).

4.4 Significance

This model is the first to quantitatively measure psychological safety in *D&D* groups and the first to begin validating a multi-item measure of DM facilitation. Psychological safety is often treated as a single construct. This model recognizes that psychological safety is not only a construct that is sometimes present in *D&D* groups, as assumed but never empirically verified, but that it contains two main factors that lend an understanding of how both facilitators and group members contribute to their experiences. Practitioners assume that facilitation is primarily responsible for the outcomes and experiences of a group. This model provides both support and adds some nuance to understanding how facilitation is critically interrelated with group dynamics but does not solely guarantee certain experiences or outcomes, such as psychological safety or creativity.

Traditional leadership theories, often referred to as *Great Man* theories, focus on the traits and behav-

iors of an individual leader—typically a charismatic man—who wields authority over others. These theories emphasize inherent personal qualities, hierarchical control, and productivity, aligning with classical management approaches. In contrast, contemporary leadership theories have evolved to account for the role of followers, group dynamics, and contextual influences. Modern frameworks recognize leadership as a relational and networked process, addressing complexity, shared leadership, and adaptive interactions. This shift from *leader* to *leadership* is well-documented in Dugan (2024), illustrating the transition from trait-based authority to collaborative and situational leadership models. The reciprocal relationships in this analysis also point to a mutual influence between the group and the facilitator in contrast to traditional top-down or linear assumptions about leadership and teaching.

4.5 Limitations

This research relied on a convenience sample to collect responses to an Internet survey, which comes with the potential for self-selection bias in taking internet surveys, so it is unknown how this effect may be present in this sample or if participants from various platforms (ie, Reddit, Facebook) differ. Sampling criteria limited participation to the same game, *D&D*, which aids in providing some consistency. Many possible sampling characteristics are relevant for future research, which were not collected in this initial exploratory survey. These include: gender, cultural groups, geographical regions, and modality (in-person or online). The results may not be generalizable to all tabletop RPGs, or even to all *D&D* groups, or instances of playing. The GM facilitation scale is improved from the original qualitatively analyzed items and may not be all-encompassing as there may be additional items about facilitation of tabletop RPGs to add which were not part of the source material for this scale. It is also conceivable that different games may have unique forms of facilitation or rely more heavily on different items.

4.6 Implications for Research

The GM facilitation scale can be used and developed further in future research about facilitation in tabletop RPG groups that explore applied RPG strategies. The combination of leisure gaming facilitation with professional methods (ex. pedagogies and therapeutic interventions) also needs to be directly investigated. Other aspects of design and accompanying functional activities like reflection are yet to be comprehensively analyzed on a large scale. Crucially, the way power and privilege impact all of the factors in the Nexus Network model must be interrogated since *D&D* is known to involve problematic structures and histories (Garcia 2017). Other games and formats such as live action role-play should be included. There are many desired benefits and intended uses for applied RPGs that are yet to be investigated in peer-reviewed research, beyond creativity. Both qualitative and quantitative research projects should continue to investigate the experiential and interpersonal aspects of playing tabletop RPGs as they relate to other forms of facilitation and functional interactions in groups with intended outcomes.

4.7 Recommendations for Practice

The GM facilitation scale can inform facilitation in tabletop RPG groups. DMs can rely on the items in this scale to prioritize what skills and behaviors they utilize while facilitating. These findings can inform the use of tabletop RPGs applied to education, personal growth, creativity, and training contexts by providing some specific reports about the use of facilitation when attempting to generate or leverage psychological safety, group cohesion, or creativity.

5. CONCLUSION

This study has provided valuable insights into the intricate dynamics of facilitation, psychological safety, group cohesion, and creativity within the context of tabletop role-playing games (TTRPGs), specifically focusing on *Dungeons & Dragons* 5th Edition (*D&D* 5e). By employing a multi-faceted survey research design, we successfully identified factors of key constructs including facilitation, clarity, cohesion, support, and creativity, offering a nuanced understanding of how these elements interplay to shape the gaming experience.

The findings revealed that facilitation by the Dungeon Master (DM) influences the levels of clarity, cohesion, and support within the group, which in turn are crucially related to creativity. Interestingly, while facilitation itself did not directly link with creativity, it played an essential role in fostering an environment interconnecting with psychological safety and group cohesion, thereby indirectly linking to creativity. This emphasizes the importance of skilled facilitation in creating a supportive and cohesive group dynamic, which is conducive to creativity, and the equally important group dynamics involved in playing *D&D*.

Moreover, the introduction of the Nexus Network Model has provided a robust framework for understanding the interconnectedness of these constructs. This model highlights the central role of psychological safety, characterized by clarity and support, along with cohesion in mediating the possible link between facilitation and creativity. By situating facilitation and creativity as separate nodes each interconnected by the nexus of clarity, cohesion, and support, this model offers a nuanced view of how group dynamics in tabletop RPGs can be leveraged to achieve desired outcomes.

The development of a multi-item scale to measure DM facilitation represents a significant advancement in tabletop RPG research. This scale not only provides a tool for future studies to quantitatively assess facilitation practices but also offers practical guidance for DMs aiming to enhance their facilitation skills. These insights are particularly relevant for practitioners seeking to apply tabletop RPGs in educational, therapeutic, or training contexts, where the intentional cultivation of psychological safety and group cohesion can lead to enhanced creativity and personal growth.

In conclusion, this study underscores the complex yet pivotal role of facilitation in tabletop RPGs and its indirect influence on creativity through the mediation of psychological safety and group cohesion. Future research should continue to explore these dynamics across different tabletop RPG systems and contexts, including live action role-play and other game formats. Additionally, examining the impact of power and privilege within these gaming environments will be crucial to fully understand and harness the transformative potential of tabletop RPGs.

STATEMENTS AND DECLARATIONS

Ethical considerations

The study was approved by the University of San Diego Institutional Review Board (IRB-2018-498).

Consent to participate

All participants provided electronic informed consent before participating by acknowledging the consent information before taking the electronic survey.

Consent for publication

Not applicable.

Declaration of conflicting interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding statement

The author(s) received no financial support for the research, authorship, and/or publication of this article.

REFERENCES

- Balzac, Stephen R. 2016. "An Exploration Into How Live Action Role-Playing Game (LARP) Participants Experience Leadership, Decision Making, and Working Within a Group in Non-Game Social Interactions." Ph.D. diss., Capella University. ProQuest Dissertations Publishing, 2016.
- Bandura, Albert, and National Institute of Mental Health. 1986. *Social Foundations of Thought and Action: A Social Cognitive Theory*. Prentice-Hall, Inc.
- Bean, Anthony, Emory S. Daniel Jr., Sarah A. Hays, eds. 2020. *Integrating Geek Culture Into Therapeutic Practice: The Clinician's Guide to Geek Therapy*. Leyline Publishing.
- Bowman, Sarah Lynne. 2010. *The Functions of Role-playing Games: How Participants Create Community, Solve Problems, and Explore Identity*. McFarland & Co.
- Bowman, Sarah Lynne. 2013. "Social Conflict in Role-Playing Communities: An Exploratory Qualitative Study." *International Journal of Role-Playing* 4: 4–25. [Link here.](#)
- Bowman, Sarah Lynne, and Kjell Hedgard Hugaas. 2019. "Transformative Role-play: Design, Implementation, and Integration." *Nordiclarp.org*, December 10. [Link here.](#)
- Bowman, Sarah Lynne, and Andreas Lieberoth. 2018. "Psychology and Role-Playing Games." In *Role-Playing Game Studies: A Transmedia Approach*, edited by José P. Zagal and Sebastian Deterding. Routledge.
- Chung, Tsui-shan. 2013. "Table-top Role-playing Game and Creativity." *Thinking Skills and Creativity* 8: 56–71. [Link here.](#)
- Cover, Jennifer Grouling. 2010. *The Creation of Narrative in Tabletop Role-Playing Games*. McFarland & Co. Publishers.

- Cragoe, Nicholas G. 2015. "RPG Mythos: Narrative Gaming as Modern Mythmaking." *Games and Culture* 11 (6): 583-607. [Link here.](#)
- Crocco, Francesco, Kathleen Offenholley, and Carlos Hernandez. 2016. "A Proof-of-Concept Study of Game-Based Learning in Higher Education." *Simulation & Gaming* 47 (4): 403-422. [Link here.](#)
- Daniau, Stéphane. 2016. "The Transformative Potential of Role-playing Games: From Play Skills to Human Skills." *Simulation & Gaming* 47 (4): 423-444. [Link here.](#)
- Department of Game Design. "Transformative Play Initiative." Uppsala Universitet, Accessed March 13, 2025. [Link here.](#)
- Dugan, John P. 2024. *Leadership Theory: Cultivating Critical Perspectives*. United Kingdom: Wiley.
- Edmondson, Amy. 1999. "Team Psychological Safety and Learning Behavior Survey." PsycTESTS. [Link here.](#)
- Game to Grow. N.d. "Welcome to Game to Grow." Accessed March 13, 2025. [Link here.](#)
- Garcia, Antero. 2016. "Teacher as Dungeon Master: Connected Learning, Democratic Classrooms, and Rolling for Initiative." In *The Role-Playing Society: Essays on the Cultural Influence of RPGs*, edited by Andrew Byers and Francesco Crocco. McFarland.
- Garcia, Antero. 2017. "Privilege, Power, and Dungeons & Dragons: How Systems Shape Racial and Gender Identities in Tabletop Role-Playing Games." *Mind, Culture, and Identity* 24, no. 3 (2017). [Link here.](#)
- Geek Therapeutics. 2024. "Geek Therapeutics." Accessed March 13, 2025. [Link here.](#)
- Hammer, Jessica, To, Alexandra, Schrier, Karen, Bowman, Sarah Lynne, and Kaufman, Geoff. 2018. "Learning and Role-Playing Games." In *Role-Playing Game Studies: A Transmedia Approach*, edited by José P. Zagal and Sebastian Deterding, 283-99. Routledge.
- Hartyándi, Mátyás, and Gijs van Bilsen. 2024. "Playing With Leadership: A Multiple Case Study of Leadership Development Larps." *International Journal of Role-Playing* 15 (June): 142-77. [Link here.](#)
- Harviainen, J. Tuomas. 2013. "Managerial Styles in LARP: Control Systems, Cultures, and Charisma." In *The Wyrd Con Companion Book 2013*, edited by Sarah Lynne Bowman and Aaron Vanek, 112-124. Los Angeles, CA: Wyrd Con.
- Kaiser, H. F. 1958. "The Varimax Criterion for Analytic Rotation in Factor Analysis." *Psychometrika* 23, no. 3: 187-200. [Link here.](#)
- Karagiorgas, Dimitrios N., and Shari Niemann. 2017. "Gamification and Game-Based Learning." *Journal of Educational Technology Systems* 45 (4): 499-519. [Link here.](#)
- Kilmer, Elizabeth, Jennifer Rubin, Michael Scanlon, and Jared Kilmer. 2024. "Therapeutically Applied RPGs to Support Adolescent Social Connection and Growth During the COVID-19 Pandemic." *Journal of Creativity in Mental Health* 19 (2): 210-231. [Link here.](#)

- Lang, J. C., and C. H. Lee. 2010. "Organizational Creativity Scale." PsycTESTS. [Link here.](#)
- Lasley, Joe. 2020. "An Examination of Gaming Environments in Dungeons & Dragons Groups." PhD diss., University of San Diego. Digital USD. [Link here.](#)
- Lasley, Joe. 2022. "Role-Playing Games in Leadership Learning." *New Directions for Student Leadership* 2022, no. 174: 73–87. [Link here.](#)
- Li, Y., et al. 2016. "Team Creativity Scale." PsycTESTS. [Link here.](#)
- May, D. R., R. L. Gilson, and L. M. Harter. 2004. "Psychological Safety Measure." PsycTESTS. [Link here.](#)
- Mercer, Matt. 2016. "GM Tips." Video Playlist. Geek & Sundry. YouTube, [Link here.](#)
- Plass, Jan L., Bruce D. Homer, and Charles K. Kinzer. 2015. "Foundations of Game-Based Learning." *Educational Psychologist* 50, no. 4: 258–283. [Link here.](#)
- Randi, Marco Antonio Ferreira, and Hernandes Faustino de Carvalho. 2013. "Learning Through Role-Playing Games: An Approach for Active Learning and Teaching." *Revista Brasileira de Educação Médica* 37, no. 1: 80–88. [Link here.](#)
- Simonet, D. V., A. Narayan, and C. Nelson. 2015. "Psychological Safety and Empowerment Questionnaire." PsycTESTS. [Link here.](#)
- Toles-Patkin, Terri. 1986. "Rational Coordination in the Dungeon." *The Journal of Popular Culture* 20 (1): 1–14. [Link here.](#)
- Tuckman, Bruce. 1965. "Developmental Sequence in Small Groups." *Psychological Bulletin* 63 (6): 384–399.
- Vorobyeva, Olga V. 2015. "Constructing of Group Identity During Live-Action Role Playing Games." *Anthropology & Archeology of Eurasia* 54 (1): 68–80. [Link here.](#)
- Wilson, David L. 2007. "An Exploratory Study on the Players of 'Dungeons and Dragons.'" PhD diss., Institute of Transpersonal Psychology. ProQuest (304743117). [Link here.](#)
- Wadsworth, B. J. 2004. *Piaget's Theory of Cognitive and Affective Development*. 5th ed. Pearson.
- Westborg, Josefin. 2023. "The Educational Role-Playing Game Design Matrix: Mapping Design Components onto Types of Education." *International Journal of Role-Playing* 13: 18-30. [Link here.](#)
- Yi, H., et al. 2017. "How Leaders' Transparent Behavior Influences Employee Creativity: The Mediating Roles of Psychological Safety and Ability to Focus Attention." *Journal of Leadership & Organizational Studies* 24 (3): 335–344. [Link here.](#)

APPENDICES

Appendix 1

Eigenvalues, Percentages of Variance and Cumulative Percentages for Factors for 7 DM Items

Factor	Eigenvalue	% of variance	Cumulative %
1	2.58	36.88	36.88
2	1.20	17.15	45.04

Appendix 2

Eigenvalues, Percentages of Variance and Cumulative Percentages for Factors for 12 PS Items

Factor	Eigenvalue	% of variance	Cumulative %
1	5.06	42.18	42.18
2	1.11	9.29	51.48

Appendix 3

Eigenvalues, Percentages of Variance and Cumulative Percentages for Factors for 13 GC Items

Factor	Eigenvalue	% of variance	Cumulative %
1	5.98	46.03	46.03
2	1.40	10.80	56.83

Joe Lasley (Ph.D.), researches how and uses role-playing games to foster psychological environments, group dynamics, and accelerate metacognition through role-awareness. Lasley is an assistant professor of leadership and organizational studies at University of Southern Maine and a leadership development consultant specializing in experiential and transformational learning. He has designed and facilitated role-playing games for leadership development across multiple industries. He holds a Ph.D. in Leadership Studies, multiple degrees in Organizational Communication, Psychology, and Higher Education Administration, and is an International Coaching Federation certified Leadership Coach.

Antonio Ruiz Ezquerro (Ph.D.) is a leadership educator and game designer based in New York, originally from Mexico City. He specializes in leadership pedagogy, game design, and the integration of leadership principles in role-playing games. Antonio teaches various leadership and game design courses as an adjunct professor at Florida State University's Leadership Learning Research Center. He holds a Ph.D. in Higher Education from Florida State University, where he also earned graduate certificates in college teaching and institutional research. Previously, Antonio completed his M.S. in Higher Education at the same institution and a Marketing BBA from James Madison University.