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Designing Public Awareness: Visual Arts, Environmental Attitudes, and Civic Engagement

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ABSTRACT: This study examines how visual arts contribute to public awareness campaigns by linking formal visual campaign design to audience engagement and the formation of environmental attitudes. Using a mixed-methods design, the research analyzes a large corpus of 10,000 visual poster-design records alongside 384 multi-item environmental attitude survey responses. Methodologically, the paper uses descriptive statistics, group comparison tests, robust regression, and binary logistic regression to assess how visual design features relate to engagement metrics and civic response readiness. The empirical findings show that awareness-oriented posters achieved slightly higher mean engagement scores (75.17) than advertising (74.88) or informative (74.55) categories, but these category-level differences were not statistically significant. Furthermore, robust regression showed that formal design metadata—including platform, topic, color count, font count, and layout complexity—explained less than 1% of total engagement variance ($R^2 = 0.002$). Conversely, the environmental attitude scale exhibited strong internal coherence ($\alpha = 0.837$), while demographic and educational covariates offered limited explanatory power regarding environmental responsibility class membership. Ultimately, the study contributes a multi-layered campaign-evaluation framework, showing that effective visual communication cannot rely on surface-level aesthetic complexity or simple audience segmentation alone; it requires strategic alignment among message clarity, audience values, ethical framing, and actionable civic guidance.

Keywords: visual arts; public awareness campaigns; environmental communication; civic engagement; environmental attitudes; campaign effectiveness.

I. INTRODUCTION

Public awareness campaigns increasingly depend on visual communication to make environmental and social challenges understandable, memorable, and personally relevant. Issues such as pollution, resource depletion, public health risk, poverty, displacement, social exclusion, and community vulnerability are often complex, spatially distant, or emotionally overwhelming. Visual arts can reduce this distance by transforming abstract problems into concrete scenes, symbols, metaphors, and narratives. Posters, murals, photography, digital illustration, infographics, street art, and visual storytelling can condense multiple layers of meaning into forms that diverse audiences can quickly recognize and emotionally process.

The persuasive value of visual arts lies not only in their aesthetic quality but also in their capacity to organize attention. A visual campaign can highlight urgency, show human consequences, identify responsible action, and encourage a sense of shared public responsibility. In the public sphere, images often travel faster than lengthy policy explanations because they can be displayed in streets, schools, health centers, museums, transport systems, and digital platforms. The visual message therefore becomes both a communicative device and a civic object: it carries information, frames interpretation, and invites participation.

Despite this importance, many public awareness campaigns still treat visual art as an auxiliary component rather than as a central strategic mechanism. Campaign evaluation often focuses on reach, exposure, impressions, or audience counts, while paying less attention to how visual composition, symbolic

framing, emotional tone, and audience orientation shape message interpretation. In social and environmental communication, this creates a methodological weakness. A campaign may be widely viewed but poorly understood; another may be visually attractive but fail to guide behavior; and another may create emotional intensity without producing constructive civic response. For this reason, stronger empirical work is needed to examine visual campaign features together with audience-related indicators.

This study approaches visual arts as a form of public communication that operates through three linked dimensions. The first dimension is formal design: color, typography, layout, platform, visual category, and topic. These features shape visibility and how messages are processed. The second dimension is engagement: observable interaction between the audience and the visual material, reflected in attention, interaction time, and other engagement indicators. The third dimension is civic response readiness: the environmental attitudes and behavioral orientations that shape whether awareness can become public action. By combining these dimensions, the study moves beyond general claims about the social value of visual arts and offers a more evidence-based assessment of how public awareness campaigns function.

This paper addresses the research problem that the relationship between visual campaign design and public engagement is often assumed rather than empirically tested. It is common to argue that murals, posters, and digital visuals can raise awareness, but it is less clear which formal features are associated with stronger engagement and whether campaign design alone can account for audience response. A further problem concerns the difference between engagement and behavioral orientation. A campaign image may attract attention, but attention does not automatically mean environmental responsibility or social commitment. Awareness communication must therefore be studied as a pathway connecting visual message design, audience attention, and attitude-based readiness to act.

The study has four aims. First, it examines the distribution of visual campaign types, topics, platforms, and design features in a large poster-design corpus. Second, it tests whether awareness-oriented poster materials differ from other poster categories in click-through rate, interaction time, and engagement score. Third, it evaluates whether basic design metadata explain engagement outcomes when platform, topic, audience segment, color count, font count, and layout structure are considered together. Fourth, it analyzes environmental attitude responses to determine whether demographic and educational indicators alone explain responsible environmental orientation.

The study is guided by four research questions. How are visual campaign records distributed across campaign category, topic, platform, design structure, and audience segment? Do awareness-oriented visual materials show stronger engagement indicators than other visual campaign categories? To what extent do formal design features and contextual controls explain engagement outcomes? How do environmental attitude indicators contribute to understanding the behavioral dimension of public awareness campaigns?

The paper is also motivated by the need to evaluate visual awareness campaigns with greater methodological transparency. Public communication about environmental and social problems often uses striking imagery, emotional slogans, and symbolic design; however, different audience groups may interpret these elements differently. A strong campaign should therefore be assessed through multiple layers: the message's visible form, the audience interaction it generates, and the attitude structure that shapes readiness to respond. This layered perspective helps researchers avoid treating visual communication as purely artistic or purely instrumental.

The study matters for cultural studies, sustainable development communication, and social policy because it situates visual arts within the practical work of public problem-solving. Governments, schools, nonprofit organizations, cultural institutions, and community groups frequently use visual materials to make social concerns publicly visible. Yet the success of these materials depends on whether they help audiences understand an issue, feel that the issue is relevant, and recognize a realistic path toward response. By testing design and attitude indicators together, the paper provides a stronger basis for designing and evaluating public awareness campaigns in contexts where communication quality and civic responsibility are both essential.

II. LITERATURE REVIEW

Environmental-awareness research shows that concern, attitude, education, and personal orientation are closely related to responsible behavior [1]. Design scholarship further positions graphic communication as a social practice that can support activism and public change rather than serving commercial purposes alone [2]. Experimental evidence indicates that pictorial warning labels can influence risk perception and behavior-related outcomes [3]. Positive, solution-focused climate imagery can also capture attention and encourage constructive engagement [4].

Cross-national research on climate visuals demonstrates that authenticity, human presence, and perceived efficacy shape how audiences interpret images [5]. Reviews of social-platform health communication show that digital channels can provide public information, emotional support, and behavior-related guidance [6]. Research on nonprofit communication similarly indicates that platform logic and audience relationships influence campaign performance [7]. Communication-design scholarship therefore argues that visual quality should be evaluated through communicative effectiveness rather than aesthetic appearance alone [8].

Social-media health-promotion research shows that campaign communication can move beyond awareness when it is designed around deeper outcome change [9]. Digital public-health campaigns also demonstrate that message form affects dissemination, reach, and audience engagement [10]. Comparative warning-message studies report stronger reactions to graphic warnings than to text-only messages across several health issues [11]. Evidence from nonprofit social-platform activity further confirms that message strategy shapes online audience response [12].

Studies of movement-oriented infographics show that visual form can connect public issues with action frames [13]. Audience research on climate-related artworks indicates that visual art can produce emotional, cognitive, and action-oriented responses [14]. Platform-specific practices in digital activism likewise influence how publics engage with visual social-change content [15]. Affective climate imagery further demonstrates that emotional content can direct attention and shape climate-related responses [16].

The sequence continues with evidence that effective climate representation on social platforms requires clarity, human relevance, and practical action guidance [17]. Research on psychological distance shows that implicit associations and perceived remoteness influence climate responses, making personal relevance essential [18]. Health-warning studies also show that visual messages affect efficacy beliefs, perceived vulnerability, and understanding of risk [19]. Climate-image research further demonstrates that different visual forms produce different levels of salience and self-efficacy [20].

A meta-analysis of pictorial warnings found that visual warnings generally outperform text-only warnings in persuasive outcomes [21]. Media-framing research shows that climate images may activate either concern or distance depending on how they are presented [22]. A broader review of climate imagery emphasizes that images structure public interpretation through meaning, truth, power, and responsibility [23]. Environmental-education evidence also links ecological behavior to the combined influence of knowledge and connectedness to nature [24].

Environmental graphic-design research suggests that carefully planned visual strategies can strengthen public concern campaigns [25]. Climate-art scholarship shows that visual art can communicate complex environmental issues by stimulating reflection, emotion, and personal meaning [26]. Experimental work on graphic warnings demonstrates that images can generate visual attention, negative affect, and intention-related responses [27]. Activist-art research likewise indicates that reflective encounters can raise awareness among public audiences [28].

Environmental art installations show that sensory experiences can link public concern to intended action [29]. Sustainability research shows that values, education, intention, and institutional context contribute to environmental behavior [30]. Digital climate-imagery studies emphasize that credibility, emotional tone, and audience fit are central to public engagement [31]. Visual communication for social change additionally requires participation, contextual sensitivity, and attention to the social life of images [32].

Taken together, the alphabetically organized evidence shows that campaign effectiveness emerges from the interaction of visual form, emotional framing, message credibility, audience relevance, platform conditions, and action guidance. Formal design choices can attract attention, but deeper public response

depends on whether images support understanding, efficacy, reflection, and a realistic pathway toward civic or environmental action.

The reviewed studies also distinguish immediate engagement from sustained behavioral orientation. Clicks, viewing time, and emotional reactions are useful indicators, but they do not independently demonstrate comprehension or responsible action. This distinction supports the present study's integrated examination of campaign-design features, engagement indicators, and environmental attitudes.

Table 1. Comparison table between studies

Ref.	Author(s) and year	Focus	Main contribution to this paper
[1]	Arshad et al. (2020)	Environmental awareness and behavior	Attitude and concern predict environmental behavior.
[2]	Bichler & Beier (2015)	Design activism	Graphic design can operate as a social-change practice.
[3]	Brewer et al. (2016)	Warning-label experiment	Graphic warnings influence risk perception and behavior-related outcomes.
[4]	Carlson et al. (2020)	Climate solution imagery	Positive solution-focused images can capture attention.
[5]	Chapman et al. (2016)	Climate visuals across countries	Authenticity, human presence, and efficacy shape how people perceive images.
[6]	Chen & Wang (2021)	Social platform health communication	Digital platforms support information, social support, and behavior-related communication.
[7]	Di Lauro et al. (2019)	Nonprofit social communication	Platform logic and audience relationships affect campaign outcomes.
[8]	Frascara (2022)	Communication design quality	Design quality should be judged by communicative effectiveness.
[9]	Ghahramani et al. (2022)	Health promotion on social platforms	Communication can move beyond awareness when designed for outcome change.
[10]	Gough et al. (2017)	Public health campaign dissemination	Message type affects reach and engagement in digital campaigns.
[11]	Hall et al. (2020)	Graphic health warnings	Graphic warnings produce stronger public reactions than text warnings.
[12]	Huang et al. (2016)	Nonprofit social platform engagement	Message strategy shapes online audience reactions.
[13]	Kaviani & Salehi (2022)	Infographics and action frames	Infographics connect visual form with movement framing.
[14]	Klockner & Sommer (2021)	Audience reaction to climate art	Visual art can provoke emotional, cognitive, and action-oriented responses.
[15]	Le Compte & Klug (2021)	Digital social activism	Platform-specific visual practices support activist engagement.
[16]	Lehman et al. (2019)	Affective climate images	Emotional imagery shapes attention and climate-related response.
[17]	Leon et al. (2022)	Climate visuals on social platforms	Effective representation requires clarity, human relevance, and guidance on action.
[18]	Leviston, Price, & Bishop (2014)	Psychological distance and affect	Visual response is shaped by implicit association and personal relevance.
[19]	Mead et al. (2016)	Health warning perceptions	Visual messages affect efficacy beliefs and risk understanding.
[20]	Metag et al. (2016)	Climate imagery and self-efficacy	Different images evoke different levels of salience and efficacy.
[21]	Noar et al. (2016)	Pictorial warnings meta-analysis	Visual warnings outperform text-only warnings in persuasive outcomes.

Ref.	Author(s) and year	Focus	Main contribution to this paper
[22]	O'Neill et al. (2015)	Climate image reception	Images may create engagement or distance depending on framing.
[23]	O'Neill & Smith (2014)	Climate imagery review	Images frame environmental problems through meaning, power, and public interpretation.
[24]	Otto & Pensini (2017)	Environmental education and behavior	Knowledge and connectedness support ecological behavior.
[25]	Reading (2021)	Environmental graphic design	Visual strategies can strengthen environmental concern campaigns.
[26]	Roosen et al. (2018)	Climate-related art	Art can communicate climate issues through reflection and emotional meaning.
[27]	Skurka et al. (2018)	Graphic warning attention	Warning visuals produce attention, affect, and intention-related responses.
[28]	Sommer & Klockner (2019)	Activist climate art	Art-based communication can raise awareness through reflective encounter.
[29]	Sommer et al. (2019)	Environmental art installation	Sensory art can strengthen concern and intended action.
[30]	Swaim et al. (2014)	Student sustainability intention	Environmental behavior depends on values, education, and intention.
[31]	Wang et al. (2018)	Digital climate imagery	Digital image engagement depends on credibility, emotion, and audience fit.
[32]	Witteveen & Lie (2020)	Visual communication for social change	Participation and context are central to social-change visuals.

1. RESEARCH GAP

The reviewed literature confirms that visual arts can influence attention, emotion, efficacy, and social engagement. However, three gaps remain. First, many studies focus on specific image sets, experimental stimuli, or single campaigns, while fewer examine large-scale campaign design records alongside engagement indicators. Second, environmental and social awareness research often separates visual communication from attitude formation, even though public response depends on both message design and audience orientation. Third, campaign evaluation frequently emphasizes visual presence or reach without testing whether formal design categories explain engagement outcomes.

This study addresses these gaps by linking a large visual campaign corpus to evidence on environmental attitudes. This design allows the paper to test whether campaign category, topic, platform, visual complexity, and audience segment are associated with engagement, while also examining whether attitude-based indicators can explain environmental responsibility. The research therefore contributes a more integrated empirical framework for evaluating public awareness campaigns.

2. STUDY CONTRIBUTION

The paper's contribution is threefold.

- Theoretically, it connects visual communication, environmental attitude formation, and civic engagement within a single campaign-analysis framework.
- Methodologically, it combines large-scale visual campaign metadata with survey-based environmental attitude evidence, allowing campaign design and public response readiness to be examined together.
- Practically, it provides guidance for cultural institutions, public agencies, nonprofit organizations, educators, and designers seeking to build awareness campaigns that are not only visually attractive but also socially meaningful, ethically grounded, and action-oriented.

3. CONCEPTUAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

The conceptual framework positions visual campaign design as the starting point of public awareness communication. Design features such as campaign category, topic, platform, color composition, font use, layout structure, and audience segment shape how a message is presented. These elements influence message processing through attention, clarity, emotional appeal, and perceived relevance. Message processing then contributes to campaign engagement, while environmental attitudes indicate the audience's broader potential civic response.

The study develops five hypotheses.

- **H1**: Awareness-oriented visual campaigns are associated with higher engagement indicators than non-awareness visual campaign categories.
- **H2**: Topic-platform alignment is associated with measurable differences in engagement score.
- **H3**: Visual complexity indicators, including color count, font count, and layout sections, are associated with campaign engagement.
- **H4**: demographic and educational indicators alone are insufficient to explain responsible environmental attitude orientation.
- **H5**: visual engagement indicators and environmental attitude indicators represent complementary dimensions of public awareness campaign effectiveness.

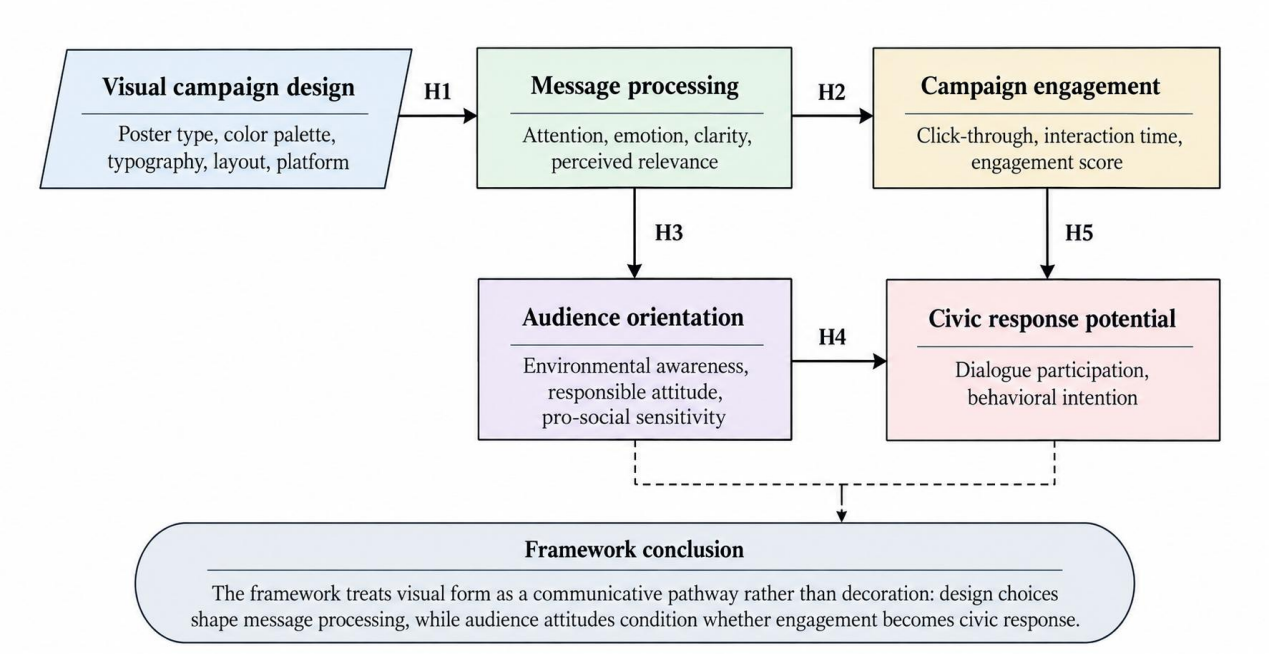


FIGURE 1. Conceptual framework of visual campaign design, engagement, and civic response.

The framework shows how visual design features move through message processing toward engagement and attitude-based public response.

III. PROPOSED METHOD

The proposed method is an integrated empirical pathway for evaluating visual arts in public awareness campaigns. It combines a campaign-design stream and an environmental-attitude stream. The campaign-design stream evaluates how visual records differ by poster category, topic, platform, audience segment, color composition, typography, and layout structure. The environmental-attitude stream assesses how respondents are distributed across environmental responsibility orientation and whether demographic and educational indicators explain this orientation.

The method follows five sequential stages. First, we prepare visual campaign records and environmental attitude responses for analysis. Second, the design and attitude variables are harmonized into comparable indicators for analysis. Third, descriptive profiling identifies the structure of the visual corpus and the distribution of environmental attitudes. Fourth, inferential estimation tests group differences, engagement models, reliability, and attitude-orientation predictors. Fifth, the results are interpreted through a campaign-effectiveness lens that distinguishes visibility, engagement, and civic response readiness.

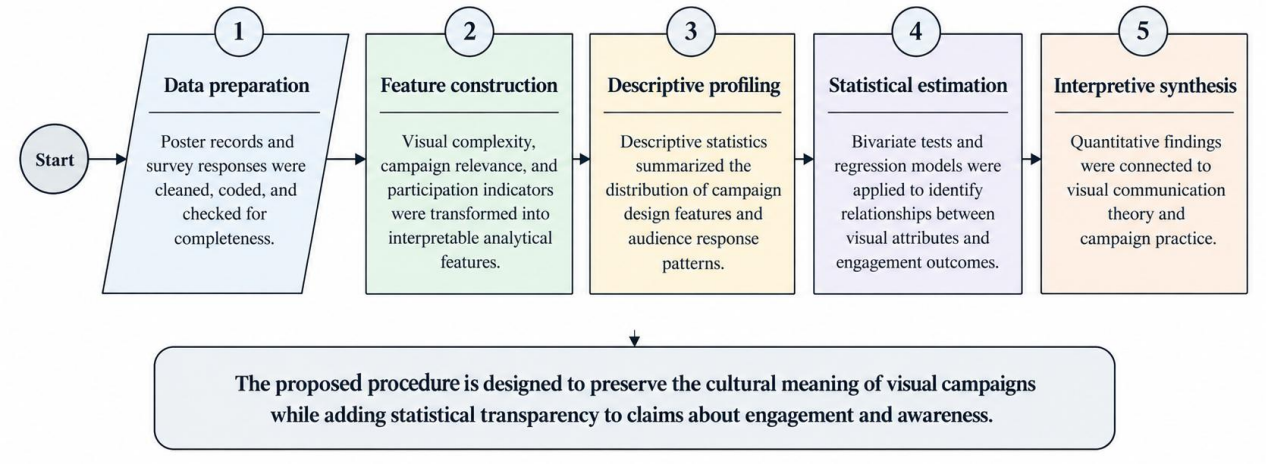


FIGURE 2. Proposed empirical method for evaluating public awareness campaign visuals.

The procedure combines visual campaign analysis with environmental attitude analysis to support a stronger empirical manuscript design.

IV. METHODOLOGY

1. RESEARCH DESIGN

The study used a mixed empirical design based on quantitative visual campaign analysis and survey-based environmental attitude analysis. The design is appropriate because the research problem concerns both campaign engagement and behavioral readiness. Visual campaign analysis measures how formal and contextual features relate to engagement indicators. Environmental attitude analysis examines whether observed demographic and educational variables explain audience orientation toward environmental responsibility.

The study is explanatory, not merely descriptive. It does not assume that visual attractiveness automatically produces awareness or behavioral change. Instead, it tests whether observable campaign-design features explain engagement and whether environmental attitudes require deeper constructs than demographic exposure. This design suits visual arts and public awareness research because it respects both the aesthetic dimension of visual communication and the social dimension of public response.

2. DATA SOURCE / PARTICIPANTS / CORPUS

The first empirical source consisted of 10,000 records of visual campaign posters. Each record represented a poster design and included poster category, campaign topic, platform, viewer age group, color composition, font structure, layout type, aspect ratio, click-through rate, interaction time, and engagement score. The corpus included awareness, informative, advertising, and event-promotion materials across public-facing topics such as health awareness, charity events, educational activities, product launches, entertainment, and technology-oriented communication.

The second empirical source consisted of 384 environmental attitude responses. The survey included demographic variables, indicators of educational exposure, and 27 attitude items. The response structure

allowed researchers to construct an environmental responsibility index after aligning items. Because the records were used in aggregated and anonymized form, no identifying information was analyzed.

3. SAMPLE SELECTION AND INCLUSION CRITERIA

For the visual campaign corpus, we included records with a complete poster category, topic, platform, design structure, audience segment, and engagement indicator. The final analytical corpus retained all complete records because it included all variables needed for analysis. We grouped records into poster categories and compared engagement indicators to assess whether awareness-oriented materials differed from other campaign types.

For the environmental attitude sample, we included responses when the attitude items and core demographic variables were available. We screened the survey items for directional consistency before constructing the scale. Items with inverse orientation were aligned so that higher values reflected stronger responsible environmental orientation. The final index was then used to assess reliability and conduct attitude-profile analysis.

4. VARIABLES / MEASURES / CODING FRAMEWORK

The main dependent variables in the visual campaign analysis were click-through rate, interaction time, and engagement score. The primary explanatory variable was poster category, with awareness-oriented posters compared against other categories. Control variables included campaign topic, platform, viewer age group, industry category, aspect ratio, layout sections, color count, and font count. We derived color count and font count from the number of distinct listed colors and font selections in each poster record, and we coded layout sections from the poster structure.

The engagement model estimated the association between design features and engagement score. The general specification is presented below.

$$Engagement = \beta 0 + \beta 1(Awareness) + \beta 2(Topic) + \beta 3(Platform) + \beta 4(Design) + \beta 5(Controls) + \varepsilon$$

Equation (1). Robust engagement estimation model

In Equation (1), Engagement represents the poster engagement score; Awareness represents the campaign category of interest; Topic and Platform represent contextual controls; Design represents visual-complexity indicators; Controls represent audience and corpus controls; and ε is the error term.

The environmental attitude index was calculated as the mean of aligned attitude items, where higher values indicate stronger responsible environmental orientation.

$$Environmental\ Attitude = (Item1 + Item2 + \ldots + Itemk) / k$$

Equation (2). Environmental attitude index

In Equation (2), Environmental Attitude is the mean of aligned attitude items, Item represents each aligned item score, and k is the number of attitude items included in the scale.

We then used binary logistic regression to examine whether demographic and educational indicators explained environmental responsibility class membership.

$$logit(p) = \alpha 0 + \alpha 1(Sex) + \alpha 2(Age) + \ldots + \alpha m(Controls)$$

Equation (3). Logistic model for environmental responsibility orientation

In Equation (3), p is the probability of belonging to the higher responsibility class, and the predictors represent demographic and educational indicators.

We evaluated the internal consistency of the environmental attitude scale using Cronbach's alpha.

$$Cronbach\ \alpha = [k / (k - 1)] \times [1 - (sum\ item\ variances / total\ scale\ variance)]$$

Equation (4). Cronbach reliability coefficient

5. ANALYTICAL PROCEDURE

The analytical procedure consisted of six steps. First, we screened the visual campaign corpus and environmental attitude responses for completeness. Second, visual design features were converted into analytical variables, including poster category, topic, platform, age group, color count, font count, and layout sections. Third, descriptive statistics were produced for engagement indicators and attitude measures.

Fourth, we conducted group comparisons to test whether awareness-oriented posters differed from other poster categories in click-through rate, interaction time, and engagement score.

Fifth, we used robust regression to assess whether poster category, topic, platform, audience group, and design-complexity indicators explained engagement score. Sixth, we aligned environmental attitude items, tested reliability, and used logistic regression to examine whether demographic and educational variables explained attitude-class membership. The analysis was conducted using standard statistical software, and results were interpreted at conventional levels of statistical evidence while emphasizing effect size, practical meaning, and methodological transparency.

6. VALIDITY, RELIABILITY, AND ETHICAL CONSIDERATIONS

Construct validity was supported by linking each variable to the conceptual framework. Engagement indicators represented audience interaction with visual materials. Design variables represented observable formal and contextual campaign features. The environmental attitude index reflected responsible environmental orientation after aligning items. We assessed reliability through internal consistency of the attitude items, and the resulting coefficient indicated strong coherence after aligning the reverse-direction items.

Ethical risk was limited because the study used anonymized secondary records and aggregated response data. The researcher did not contact, recruit, observe, or personally identify any participant. The visual campaign analysis focused on design metadata and engagement indicators rather than private identity. The environmental attitude analysis was reported only in aggregate form. The study therefore followed principles of privacy protection, responsible interpretation, and non-identification.

V. RESULTS

The visual campaign corpus contained 10,000 complete poster records. Engagement score averaged 74.76 (SD = 14.51), indicating a generally moderate-to-high engagement distribution with substantial variation across individual visual materials. Click-through rate averaged 9.96, while interaction time averaged 17.43 seconds. On average, posters used 4.52 colors, 2.00 font selections, and 2.49 layout sections. These results indicate that the corpus was visually diverse but not extremely complex in form.

Table 3. Descriptive profile of the visual campaign corpus.

Measure	Value	Interpretation
Poster records	10,000	Complete visual campaign records used in analysis
Click-through rate	M = 9.96; SD = 5.79	Audience response indicator
Interaction time	M = 17.43; SD = 7.24	Attention-duration indicator
Engagement score	M = 74.76; SD = 14.51	Overall campaign interaction indicator
Color count	M = 4.52; SD = 1.13	Visual complexity indicator
Font count	M = 2.00; SD = 0.81	Typography complexity indicator
Layout sections	M = 2.49; SD = 1.12	Composition complexity indicator

The table reports the main descriptive indicators used to evaluate the structure and engagement level of the visual campaign records.

Mean engagement differed only slightly across poster categories. Awareness-oriented posters achieved a mean engagement score of 75.17, compared with 74.88 for advertising, 74.55 for informative materials, and 74.45 for event-promotion materials. Although the awareness category had the highest mean score, the differences across poster types were not statistically significant. Group comparison tests showed no significant difference in click-through rate, interaction time, or engagement score by poster category. This finding suggests that the label or category of a visual campaign does not by itself determine audience engagement.

Table 4. Engagement indicators by poster category.

Poster category	CTR mean	Interaction mean	Engagement mean	Records
Advertising	9.99	17.45	74.88	2,513
Awareness	9.93	17.38	75.17	2,518
Event promotion	9.78	17.46	74.45	2,437
Informative	10.12	17.44	74.55	2,532

The table compares mean engagement indicators across poster categories and shows that awareness posters had slightly higher overall engagement.

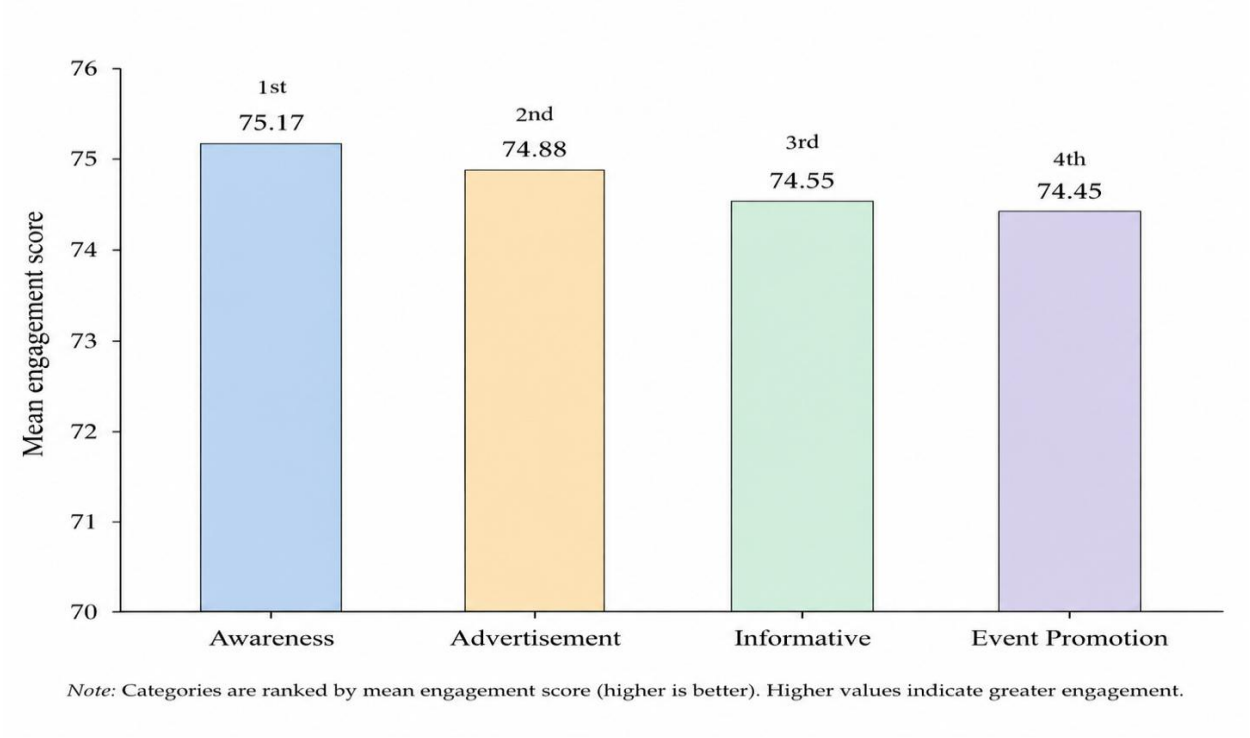


FIGURE 3. Mean engagement score by poster category.

The chart shows small differences among categories, with awareness-oriented posters recording the highest mean engagement score.

The heatmap of topic-platform engagement shows that topic and platform combinations produced visible descriptive differences, but these differences should be interpreted cautiously because the regression model explained only a very small portion of engagement variance. The evidence indicates that topic-platform alignment matters as a design consideration, yet available metadata do not fully capture the quality of message framing, visual symbolism, emotional appeal, or cultural relevance.

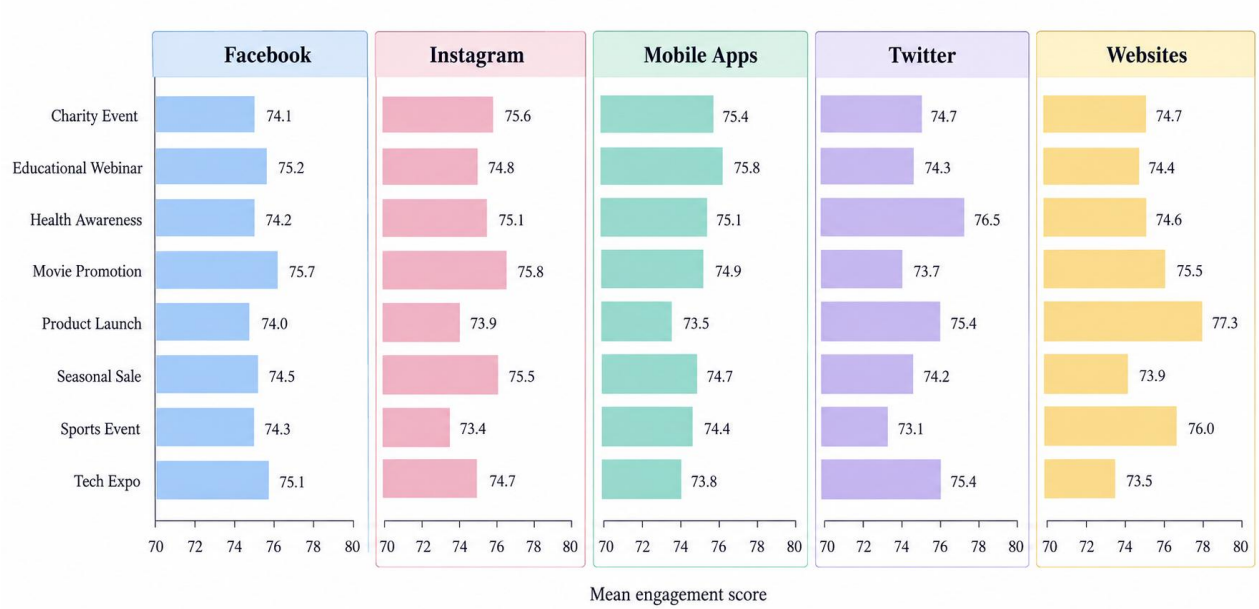


FIGURE 4. Mean engagement by topic and platform.

The heatmap illustrates descriptive variation in engagement across campaign topics and communication platforms.

The robust engagement model confirmed that basic formal and contextual design variables had limited explanatory power. The model explained less than one percent of engagement variation. The awareness category had a positive coefficient, but the coefficient was not statistically significant. Color count, font count, and layout sections also showed weak associations with engagement score. This result is important because it challenges the simple assumption that more visual complexity or an awareness label automatically produces stronger engagement.

Table 5. Robust engagement model for visual campaign records.

Predictor	Estimate	Robust SE	p-value	Interpretation
Awareness poster category	0.32	0.41	0.443	Not supported
Event-promotion category	-0.41	0.41	0.320	Not supported
Informative category	-0.33	0.41	0.418	Not supported
Color count	-0.16	0.13	0.205	Not supported
Font count	-0.04	0.18	0.841	Not supported
Layout sections	-0.02	0.13	0.867	Not supported
Model fit	$R^2 = 0.002$	-	-	Very limited explanatory power

The table reports a simplified engagement model and shows that basic design metadata had weak explanatory power.

The environmental attitude responses provided a stronger basis for understanding the civic response dimension. After alignment of inverse items, the environmental attitude index had a mean of 3.99 and a standard deviation of 0.39. Internal consistency was strong, with Cronbach's alpha equal to 0.837. This indicates that the attitude items coherently measured a responsible environmental orientation. The distribution was concentrated toward the upper range, suggesting that many respondents expressed relatively positive environmental attitudes.

Table 6. Environmental attitude scale and response profile.

Measure	Value	Interpretation
Environmental attitude responses	384	Complete survey responses analyzed
Attitude items	27	Multi-item environmental orientation scale
Aligned attitude index	M = 3.99; SD = 0.39	Higher scores indicate stronger responsibility orientation
Reliability coefficient	α = 0.837	Strong internal consistency after item alignment
Higher responsibility class	56.0%	Majority of responses fell into the higher orientation group
Lower responsibility class	44.0%	Substantial minority remained below the higher orientation threshold

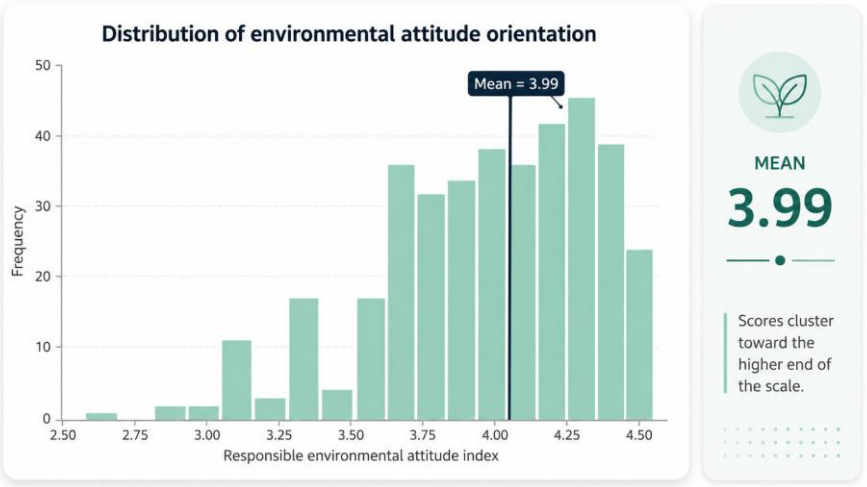


FIGURE 5. Distribution of responsible environmental attitude index.

The distribution indicates that many respondents showed relatively high responsible environmental orientation after item alignment.

The logistic regression of environmental responsibility class showed that demographic and educational exposure variables alone did not strongly explain attitude-class membership. Sex had the strongest coefficient among the predictors, but it did not reach conventional significance. Age, grade, prior environmental education, prior climate-related coursework, environmental literacy coursework, income status, preschool education, residence, and number of siblings were not statistically significant. These results support the argument that responsible environmental attitudes cannot be reduced to simple demographic exposure. Public awareness campaigns therefore need to address values, interpretation, perceived efficacy, and social meaning rather than relying only on audience segmentation.

Table 7. Logistic regression results for environmental responsibility class.

Predictor	Odds ratio	95% CI	p-value	Interpretation
Sex	1.49	0.98-2.27	0.065	Borderline, not decisive
Age	0.98	0.91-1.05	0.534	Not decisive
Grade	1.05	0.85-1.28	0.657	Not decisive
Environmental education course	1.16	0.65-2.06	0.619	Not decisive
Climate-related course	0.87	0.45-1.68	0.670	Not decisive
Environmental literacy course	0.80	0.42-1.54	0.512	Not decisive

Predictor	Odds ratio	95% CI	p-value	Interpretation
Income status	0.97	0.80-1.18	0.759	Not decisive
Preschool education	0.72	0.47-1.10	0.129	Not decisive

The table shows that demographic and educational exposure variables alone provided limited explanation of attitude-class membership.

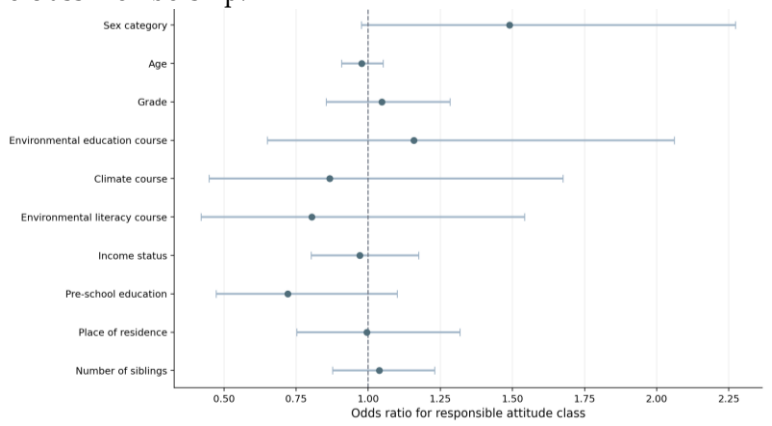


FIGURE 6. Odds ratios for environmental responsibility class.

Table 8. Hypothesis decisions based on empirical findings.

Hypothesis	Statement	Decision	Evidence
H1	Awareness posters show higher engagement than non-awareness categories.	Not supported statistically	Awareness posters had the highest mean engagement, but differences were not statistically significant.
H2	Topic-platform alignment is associated with engagement differences.	Partially supported descriptively	Heatmap patterns showed descriptive variation, but regression evidence remained weak.
H3	Visual complexity indicators are associated with engagement.	Not supported	Color count, font count, and layout sections were not strong predictors.
H4	Demographic and educational variables alone are insufficient to explain environmental responsibility orientation.	Supported	Logistic results showed limited explanatory power for simple background variables.
H5	Visual engagement and environmental attitude indicators are complementary dimensions of campaign effectiveness.	Supported conceptually and empirically	The two empirical streams measure different but necessary layers of awareness communication.

VI. DISCUSSION

The findings provide a nuanced interpretation of the role of visual arts in public awareness campaigns. The study confirms that awareness-oriented visual materials can achieve slightly higher mean engagement than several other poster categories, but the statistical evidence does not support a strong category effect.

This result is important because it prevents an overly simple conclusion that the awareness label itself produces engagement. Public awareness campaigns cannot rely only on being identified as socially meaningful. They must also build message clarity, visual relevance, emotional balance, and action guidance into the design process.

The engagement model's weak explanatory power shows that formal metadata alone cannot capture the full communicative force of visual arts. Variables such as color count, font count, and layout sections describe structural properties of posters, but they do not measure symbolic strength, narrative coherence, cultural resonance, moral framing, or credibility. A poster with fewer colors can be powerful if its metaphor is clear and locally meaningful. A visually complex design can fail if it overwhelms the audience or lacks behavioral direction. Therefore, treat visual complexity as a design condition, not an automatic predictor of public engagement.

The results also show that topic-platform combinations generate descriptive variation in engagement. This supports the idea that public awareness campaigns must be adapted to the communication setting in which they appear. A poster on a mobile-centered platform may need a different layout and message hierarchy than one used in a public institution or community space. Similarly, health awareness, charity, educational, environmental, and cultural messages may require different emotional tones. Some topics benefit from urgency and risk framing, while others may require hope, community identity, or solution-oriented imagery. This means that effective visual communication depends on alignment among topic, medium, audience, and desired action.

The environmental attitude findings extend the interpretation beyond engagement metrics. The attitude scale showed strong internal coherence after item alignment, indicating that responsible environmental orientation is a measurable construct. However, simple background variables did not strongly explain environmental responsibility class membership. This finding is meaningful for public awareness campaign design. It suggests that audience response cannot be understood only through demographic segmentation or prior educational exposure. Campaigns must engage the values, emotions, perceived efficacy, and social identities that shape whether people feel capable of acting on environmental and social concerns.

Taken together, the two empirical streams show that visual arts operate through both surface-level and deeper mechanisms. Surface-level mechanisms include visibility, readability, color, layout, platform, and immediate interaction. Deeper mechanisms include meaning, empathy, perceived responsibility, collective identity, trust, and readiness to act. A campaign may perform well in terms of engagement while still failing to produce durable awareness if it does not connect to these deeper mechanisms. Conversely, a campaign with moderate engagement may be socially important if it strengthens understanding, dialogue, or civic responsibility among targeted audiences.

The findings therefore support a more careful definition of campaign effectiveness. Effectiveness should not be reduced to clicks, time spent interacting, or aesthetic appeal. It should include whether the visual message is understandable, ethically framed, emotionally appropriate, culturally sensitive, and connected to a feasible behavioral or civic action. For environmental and social challenges, the strongest visual campaigns likely combine artistic quality with strategic communication design and audience-centered interpretation.

The study also has implications for evaluating visual arts within cultural and social policy. Public agencies and nonprofit organizations often commission visual materials but may evaluate them mainly through visibility or distribution. The present evidence suggests that evaluation should include both design analytics and attitude-based assessment. Designers should be involved not only in production but also in the conceptual stage, where they define issue framing, audience understanding, emotional tone, and ethical representation. In this sense, visual art becomes part of a broader public communication system rather than a final decorative layer.

Another implication is that public awareness campaigns should be designed through iterative testing rather than aesthetic judgment alone. The results suggest that basic formal characteristics alone were not sufficient to explain engagement, so campaign teams should examine whether audiences understand the visual metaphor, perceive the message as credible, and can identify a realistic action. Such testing can be conducted through short audience panels, expert review, community feedback, and comparison of alternative design versions. This would make visual campaign production more accountable while preserving artistic creativity.

The findings also encourage a more ethical approach to environmental and social imagery. Campaigns that rely heavily on fear, suffering, or disaster may attract attention but can also create fatigue, helplessness, or emotional distance. Positive, solution-oriented imagery can support efficacy, but it must not minimize the problem's seriousness. The strongest campaigns therefore likely balance urgency with possibility and emotional appeal with practical direction. This balance is especially important when campaigns address vulnerable communities, public health, environmental loss, or social inequality.

Future research should also develop richer coding frameworks for visual arts in awareness campaigns. Such frameworks may include image type, human presence, emotional tone, metaphor, realism, local identity, urgency, solution orientation, call to action, and ethical representation. Combining these variables with engagement and attitude measures would provide a stronger basis for evaluating how visual arts contribute to civic awareness and social transformation.

VII. CONCLUSION

This study examined the role of visual arts in public awareness campaigns by combining evidence from visual poster-design records and environmental attitude responses. The findings show that visual arts remain highly important for communicating environmental and social challenges, but their effectiveness should not be assumed from aesthetic presence alone. Awareness-oriented posters achieved the highest mean engagement score among the examined categories, yet the difference was not statistically decisive. Robust estimation further showed that basic design metadata, including poster category, platform, topic, color count, font count, and layout sections, explained only a limited share of engagement variation. This suggests that campaign effectiveness depends on deeper communicative qualities that formal features do not fully capture. These qualities include message clarity, emotional relevance, ethical framing, cultural resonance, and action guidance. The environmental attitude analysis strengthened this interpretation. The attitude scale showed strong internal consistency, while demographic and educational exposure variables alone did not explain responsibility orientation well. This means that awareness campaigns should not rely only on audience segmentation or visual complexity. They must connect visual design with values, perceived efficacy, and social meaning. The paper therefore concludes that visual arts can support civic engagement and behavioral change when they are integrated into a strategic communication process that links design form, audience interpretation, and public action. For researchers, the study provides a framework for evaluating campaign visuals empirically and for separating simple visibility from meaningful awareness. For practitioners and policymakers, it shows that strong public awareness campaigns require collaboration among artists, designers, institutions, educators, and communities. The main practical lesson is to plan campaign visuals as part of a complete communication pathway: problem framing, visual design, audience interpretation, engagement measurement, and civic response. Visual arts are most effective when they make urgent issues visible while also helping audiences understand why the issue matters, why their response is possible, and how collective action can begin.

Author Contributions

The author conducted the conceptualization, methodology, data analysis, investigation, writing, review, editing, and final approval of the manuscript.

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Data Availability

The dataset will be available from the author upon reasonable request.

Conflicts of Interest

The author declares no conflict of interest.

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APPENDICES

Appendix A. Coding framework for visual campaign records.

Variable group	Coding	Analytical role	Main section
Poster category	Awareness, informative, advertising, event promotion	Campaign purpose	Methodology/Results
Campaign topic	Health, charity, educational, cultural, commercial, and event topics	Issue/message domain	Methodology/Results
Platform	Public-facing communication channel	Distribution context	Methodology/Results
Viewer age group	Audience segment grouped by age range	Audience orientation	Methodology/Results
Color count	Number of distinct colors listed for each poster	Visual complexity	Methodology/Results
Font count	Number of font selections listed for each poster	Typography complexity	Methodology/Results
Layout sections	Number of structural sections in the layout	Composition complexity	Methodology/Results
Engagement indicators	Click-through rate, interaction time, engagement score	Audience interaction	Methodology/Results

1. APPENDIX TABLE A1. CODING FRAMEWORK FOR VISUAL CAMPAIGN VARIABLES.

The appendix table provides the main coding logic used to convert visual campaign records into analytical variables.

Appendix B. Analytical workflow summary.

Analytical step	Procedure
Step 1	Screen visual campaign and environmental attitude records for completeness.
Step 2	Construct visual complexity indicators from colors, fonts, and layout sections.
Step 3	Compare awareness posters with other poster categories using engagement indicators.
Step 4	Estimate a robust engagement model using category, topic, platform, audience, and design controls.
Step 5	Align environmental attitude items and calculate reliability.
Step 6	Estimate environmental responsibility class using demographic and educational indicators.
Step 7	Interpret findings through the conceptual framework and hypothesis structure.